CERAMIC ETHNOARCHAEOLOGY AMONG THE GAMO OF SOUTHWESTERN ETHIOPIA

By

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For Ray C. Arthur and Frances B. Arthur

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By

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Chair: Steven A. Brandt
Major Department: Anthropology

The goal of this research is to provide an understanding of ceramic assemblage variation in the interpretation of nonwestern agrarian societies. My research in a contemporary setting was undertaken among the Gamo people of southwestern Ethiopia. The Gamo are an agrarian society who produce and use pottery for the daily activities of cooking, serving, storing, and transporting water and a variety of foods. I spent two years working among the Gamo focusing on pottery procurement, production, distribution, use, reuse, and discard within a household context. I use the life-cycle of pottery to explore how pots move through different social and economic contexts from the time they are produced to eventual discard. In addition, research issues concentrating on spatial analysis, use-alteration, population size, and use-life are explored through the regional, social, and economic conditions of Gamo society.

I inventoried and measured 1,058 vessels from 60 households in three villages. My study indicated that ceramic variability exists between regions, castes, and

economic ranks throughout the entire life-cycle and within the larger issues of space, population, and vessel use-life. The regional analyses revealed dramatic differences between pottery-producing and non-pottery-producing villages concerning how households obtain, use, mend, reuse, and discard their pottery, as well as how pottery correlates with population size, storage of vessels, and vessel longevity. The analyses concerning caste and economic wealth variability concluded that household ceramic assemblage variation has great potential to decipher household socioeconomic differences.

The significance of this project is that it will allow archaeologists to move beyond commonsense inferences about ceramics to those derived from detailed documentation in a living context. Finally, this ethnoarchaeological research will allow for global cross-cultural comparisons and, more specifically, aid researchers in interpreting regional, social, and economic variability at Ethiopian archaeological sites.

CHAPTER 1
POTTERY VARIABILITY AND THE LIFE-CYCLE PERSPECTIVE

> A potter once lived, by herself, on top of Tsudo Mountain. The potter collected the clay from the mountaintop and made her pots. One day she tested the strength of her pots, by rolling a pot down from the top of Tsudo Mountain. When the pot reached the bottom of the mountain it still had not broken. Knowing that she would not make a living because her pots were too strong, she left Tsudo Mountain, and that is why today no potters live in the Doko region of Gamo.[1]

This traditional story of a Gamo potter epitomizes the interrelationships among social identity, economic wealth, and occupation in Gamo society. The potter was born into a low caste and she will remain in this low caste until her death. The story also reflects the economic alienation of potters in Gamo society. Potters and other artisans usually have households located on poor agricultural land and they are clustered together away from higher caste households. In the story, the potter lives by herself on top of a mountain that is an area of high soil erosion and unsuitable for farming. Without farmland, the potter must provide a livelihood for herself by producing and selling her pots. She needs consumers to continue purchasing her pots after they break, but since her pots were too strong, she was forced to live in another region of Gamo. This story illustrates how pottery interfaces with many of the social and economic variations that occur within Gamo society.

[1]The story was told to me by a *Maka* (a Gamo religious leader) living in Etello, a non-pottery-producing village, and one of the three villages discussed in this analysis.

As the potter depended on her pots to break, archaeologists depend also on broken pots to help us understand social and economic variability. Earlier studies (e.g., Deetz 1968, Hill 1970, and Longacre 1968, 1970) showed that ceramics could help to distinguish inter and intrasite variation by attempting to explore the relationship between ceramic style and social complexity. These earlier studies inspired archaeologists to use their ceramics to go beyond defining culture areas and chronological sequences. However, the success of interpreting social and economic variation from pottery has been limited for archaeologists (Plog 1980:6-12). Documenting and understanding the complexity of social and economic variation through pottery suggests there is a need for multiple lines of evidence to control for socioeconomic variation. I use the life-cycle of pottery, specifically procurement, production, distribution, use, reuse, and discard among different villages and households to understand social and economic variation. Within the framework of the life-cycle of pots, I explore the spatial use of pots, their use-alteration attributes, the correlations between the frequency and volume of pots with household population, and their use-life.

Ethnoarchaeological analyses allow archaeologists to observe and interpret the different life-cycle stages that household ceramics undergo. This is important to the study of archaeology because archaeologists should not assume that the material remains uncovered were last in a state of discard. Depending on the type of abandonment, people may abandon their primary-use or reuse vessels. Therefore, understanding how to interpret the different life-cycle stages in the archaeological record may allow archaeologists to make more meaningful inferences relating to

activity areas, abandonment, formation processes, and scavenging behavior. In addition, translating the different life-cycle stages in the archaeological record should provide a more accurate delineation of the social and economic context of prehistoric and historic sites.

The southwestern region of Ethiopia (Figure 1-1) is one of the few places in the world where locally made pottery is a dominant material in the everyday life of rural societies. The Gamo continue to produce and use pottery on a daily basis for cooking, storing, serving, and transporting water and a variety of foods. At present, industrial vessels have not made a significant impact on household assemblages. Ethnoarchaeology undertaken in a society where people still use low-fired ceramics in everyday life provides a powerful contextual framework for archaeological inferences, especially since little behavioral information exists concerning the use of low-fired ceramics in past and present societies. I believe the Gamo people of southwestern Ethiopia offer a unique opportunity for testing a range of hypotheses encompassing each life-cycle stage.

Social and Economic Variation among the Gamo

To analyze social and economic variation, I collected information on 1,058 vessels from 60 households in three Gamo villages, three castes, and across socioeconomic rank. Caste membership in Gamo society is ascribed, endogamous, occupational, and has restrictions on commensality and concepts of purity and pollution. Interpreting the social and economic variation from pottery requires an

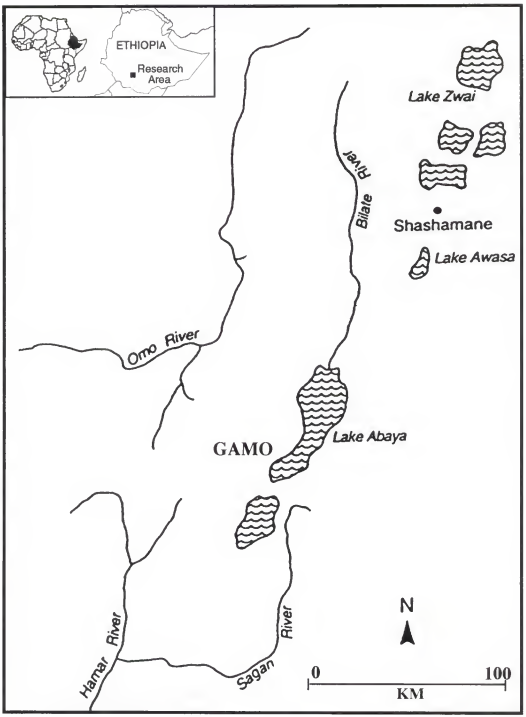

Figure 1-1: Map of the Gamo region within Ethiopia and Africa.

analysis that is not direct or simple, and requires linking the socioeconomic context with the life-cycle and structural properties of Gamo society (Figure 1-2).

Castes and economic wealth are two types of Gamo socioeconomic organization that I investigated using household ceramic assemblages. A major goal was to test if patterns in Gamo household pottery represented different castes and economic ranks so that archaeologists could identify castes and economic wealth in the archaeological record. It should be clear that caste hierarchy and economic wealth are not commensurate in Gamo society. For example, an elderly widow who belongs to the highest caste is not necessarily wealthy. Her lack of wealth comes from her inability to farm her land and her income comes only from spinning cotton. Her reduced income situates her in the poorest economic stratum.

Another component of my research addressed if differences occurred within the ceramic assemblages among pottery-producing and non-pottery-producing villages. I hope to show in this study that patterns found in each type of analysis help archaeologists document social and economic variation between villages and households. As the above parable indicates, there are some Gamo regions where potters do not live. Previous research among societies demonstrates variations in household ceramic assemblages among these two types of villages (Aronson et al. 1994:101; Nelson 1991; Tani 1994). Previous ethnographic studies have found that non-pottery-producing villages have a larger number of vessels because of stockpiling (Aronson et al. 1994:101; Nelson 1991:171; Tani 1994:56). In order to test if the Gamo exhibit a similar pattern to the previous research, I investigated how they distributed their pottery in relation to these two village types.

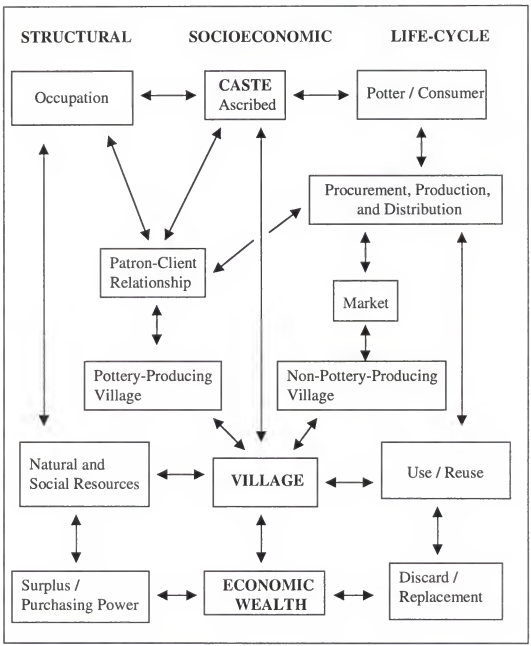

Figure 1-2: Gamo society and pottery model demonstrating the relationship among structural, socioeconomic, and life-cycle properties.

Ceramic Life-Cycle

As the Gamo parable shows us, pots have their own life-histories, pots are born; go through multiple life experiences of use, and eventually are discarded at their death. The patterns of variation occurring throughout each life-cycle stage provide a framework for interpreting household ceramic assemblages.

Ceramic procurement, production, and distribution provide the foundation for the use and eventual discard of ceramic containers within a village setting. I asked two questions concerning the differences among pottery-producing and non-pottery-producing villages. First, how do nontechnological factors (e.g., proximity to markets, vessel cost, social relationship between potters and consumers, etc.) found in different villages influence the production and use of pottery in a cultural system (Aronson et al. 1994; Gosselain 1998)? Second, are the differences in the potter's production techniques or materials used in different villages significant enough to influence how pottery consumers obtain their household pots (Schiffer and Skibo 1987)? I investigated whether consumers were purchasing their pottery based on social ties with potters or if consumers were concerned more with the potter's techniques and materials. These questions are important because archaeologists are not always able to identify the technological and nontechnological factors that influence the distribution of ceramic production and use within a region. I conducted household censuses in both types of villages to understand the decision consumers make in choosing their pottery.

I also investigated the life-cycle stages of vessel use, reuse, and discard to understand the variation found among villages, castes, and economic ranks. Following Braun (1983), ceramic vessels are tools that are directly associated with people's

actions concerning their food preparation, consumption, storage, and transport. Previous ethnoarchaeological research indicates that the ecology and the technology of food processing directly affect vessel frequencies and the types found within different villages (D. Arnold 1985:127-144; P. J. Arnold 1991:64-65; Nelson 1985:168-169). Different vessel forms are tools that allow households to process different resources into edible foods.

The study of possible associations between ceramic use and social stratification in a contemporary setting has the potential to provide inferences that are more powerful for interpreting social differences in prehistoric societies. The types of vessels used in preparing, transporting, and serving specific foods may provide a better understanding of the relationship between ceramics, foods, and the distribution of power and status (Goody 1982:37).

There have been a number of different ethnographic and historical studies indicating that the different items used in food preparation reflect the quality of diet and wealth in agrarian societies (Castro et al. 1981; DeWalt 1983; Lewis 1951; Otto 1984). Trostel (1994) found that vessel volume (including metal vessels) is a better indicator of wealth among the Kalinga than the number of vessels present. Archaeological research also indicates that different ceramic assemblages may indicate dietary differences between low and high status residences (Cowgill et al. 1984). In addition to possible dietary differences among the distinct socioeconomic classes, differences may also exist concerning frequency of ceramic forms, discard rates, and taboos and proscriptive rules that limit use and ownership. For example, the wealthier segments of society may reuse their ceramic vessels less because they can

afford to replace vessels more often. This would affect the number of forms present and the discard rates that would serve as indicators distinguishing wealthier households from poorer households.

The ecological setting of a Gamo village and its associated resources affected the types and number of ceramic containers that households use. Differences in village ecology and available foodstuffs affected the types of cooking vessels and their use within a village. The Gamo region is extremely mountainous and the production of agricultural crops corresponds to specific ecological zones governed largely by altitude. Researchers have not systematically explored the variability in ceramic use between settlements where people grow different crops in distinct ecological zones. Farmers located in different ecological zones often grow different types of crops due to environmental restrictions such as soil type and water availability. If we understand the movement of crops between villages located in different ecological zones and how people use ceramics to process, store, and transport these specific foods, then archaeologists will have a fuller understanding of ceramic function. I documented the context of ceramic vessels and their corresponding uses within households and between settlements located in different ecological zones. I believe my study linking the ceramic assemblages with the ecological setting will provide archaeologists with information in which to build models that are more effective for interpreting ceramic use.

Vessel use, reuse, and their eventual discard have important implications concerning how archaeologists interpret the function of different vessel types, subsistence, food processing, activity areas, socioeconomic status, and the interaction

between potters and consumers (Aronson et al. 1994; D. Arnold 1985; P. J. Arnold 1991; Deal 1985, 1998, Deal and Hagstrum 1995; Hally 1983; Miller 1985; Nelson 1991; Schiffer 1972). My study of vessel use, reuse, and discard provides contextual information that archaeologists can use to help in their interpretation of ceramic function and household socioeconomic variation.

Use-alteration

Use-alteration is another aspect of ceramics that I examined in this study. The use of a pottery vessel leaves markers on the ceramic wall, both interior and exterior, that can inform the archaeologist how the vessel functioned in the past. Ethnoarchaeological studies of ceramic use have proven vital for revealing specific use-alteration patterns, such as carbon deposits and surface abrasions on ceramic vessels that represent specific types of food processing (Kobayashi 1994; Skibo 1992). Matson (1965:202-217) was the first to advocate that archaeologists need to focus on the processes of pottery production and use, rather than just using ceramics for cultural-historical reconstructions. He suggested that archaeologists should analyze wear patterns for evidence of use in the form of abrasions.

Systematic archaeological use-alteration studies began in the 1970s with research by Griffiths (1978), whose work was then followed by a number of other researchers (Bray 1982; Crown 1994:99-113; Hally 1983; E. F. Henrickson 1990; R. C. Henrickson 1992; Jones 1989). These researchers linked specific use-alteration patterns to: (1) specific abraders (Griffiths 1978; R. C. Henrickson 1992); (2) patterns of carbon deposition and oxidation discoloration indicating how vessels were placed in the hearth (Hally 1983); and (3) specific vessel use by pitting, abrasions, striations,

and carbon deposition (Bray 1982; Crown 1994; Hally 1983; E. F. Henrickson 1990; Jones 1989; Skibo and Blinman 1999).

Experimental research also has revealed that different materials interact with pottery including salt (O'Brien 1990) and water (Skibo and Schiffer 1987). Furthermore, experimental research indicates that specific types of abraders produce specific wear patterns on pottery (Schiffer and Skibo 1989).

Skibo's (1992) and Kobayashi's (1994) studies among the Kalinga are currently the only other ethnoarchaeological studies of ceramic use-alteration within a village setting. Kobayashi (1994) and Skibo (1992) obtained household pottery inventories, ceramic use-alteration data, economic and census information, and made observations of pottery use from 40 households in three villages from which they also collected 189 used vessels (Kobayashi 1994:129; Skibo 1992:63). Skibo's (1992) research correlated specific types of ceramic use-alteration attributes (i.e., carbon deposition, pedestalled temper, and thermal spalling) to specific types of cooking processes. Kobayashi's (1994) research indicated that the Kalinga cook rice and vegetable/meats differently from each other, subsequently producing distinct use-patterns such as color differences, thermal spalling, interior nicks, and oxidized patches on the vessels.

Nonetheless, at present archaeologists have little information for understanding how use-alteration reflects the complex nature of ceramic life-cycles (single use, multiple use, storage, cooking, transporting, serving, etc.). Researchers have revealed a number of use-alteration attributes, but archaeologists need to develop further their understanding of the various use-events a vessel undergoes during different stages of the life-cycle and how these life-cycle stages relate to use-alteration. Furthermore, no

ethnoarchaeological studies have addressed use-alteration variation among different villages and socioeconomic households.

The Gamo villages' ecological setting should influence the use of certain vessel types that may have a direct effect on the types of use-alteration that occur throughout the life-cycle of the vessel. For instance, differences in the types of foods grown between the lowland and highland regions may have an effect on the types of foods eaten that should influence the use-alteration patterns found on ceramic vessels. In addition, I expected that Gamo vessel types used for a single function will leave distinct use-alteration patterns, compared to vessels used for multiple functions. I also expected that a portion of the population would have a higher access to social and economic status. These high caste and wealthier households should eat specialized foods in specific vessel types, causing distinct use-alteration patterns.

Spatial Analysis

In order to further understand the variation among villages, castes, and economic wealth, I investigated the storage of pots within these three units of analysis. No studies that I am aware of have explored how different villages, castes, and economic ranks store their ceramic vessels. One of the most important criteria concerning the spatial locations of the ceramic assemblages is the organization of the household compound. Differences among villages, castes, and economic rank households concerning how they organize their compound and the amount of land they own should determine where domestic pots are stored throughout the different life-cycle stages. Ethnoarchaeological studies can address questions of discard patterning through the observation of social rules, and the location of activity areas

versus discard areas. How households curate, reuse, and scavenge pottery are also important sources of information.

The storage location of household pots is an important type of analysis in deciphering how to interpret the primary-use, reuse, and discard stages of pots. Few ethnoarchaeological studies focus on where village households place their ceramic vessels (Deal 1998:83-89; Miller 1985:70-71). Deal's (1998:83-89) study of two villages in the Tzeltal Mayan area of Chiapas, Mexico, found the same spatial pattern in both villages, with pots stored in formal and informal contexts. The storage of food preparation vessels in the interior of structures was usually associated with a food processing table, located adjacent to the back wall. Other areas of storage include clusters of vessels on benches or racks, as well as ritual type vessels associated with the house altar (Deal 1998:88). During the reuse stage, there were specific spatial locations for cooking and water-carrying vessels among the Tzeltal Maya and the Wanka of Peru (Deal and Hagstrum 1995). When vessels reached their discard stage, formal and informal contexts continue with individual vessels randomly stored throughout the household that are eventually lost. The storage of groups of vessels was located adjacent to structures that continued to serve as functional household items (Deal 1998:118-123). Comparisons to other villages around the world indicate similar types of storage of provisionally discarded pots (Lindahl and Matenga 1995:106; Reina and Hill 1978:247; Weigand 1969:23). Among the Dangwara households in Malwa India, household pots are found in five different locations: around the hearth, on the water storage table, around the large clay grain-storage bins, near the back wall of the house, and in the courtyard area, each of which are associated with specific

functional types (Miller 1985:70-71). Discarded vessels are placed in household rafters and in clusters outside the households (Miller 1985:70-71).

Working with the Gamo, I investigated the idea that ceramic vessels with specific functions, whether they are primary, secondary, etc., had a specific spatial location within the household area. The village location and the household's socioeconomic level determined the storage location of pots. Gamo households have a central area for cooking and subsequently cooking vessels were spatially concentrated near the hearth. Other vessels such as storage and serving vessels were stored or used in different areas of the household compound. The primary function of vessels may reflect their location within the household, such as the association between the hearth and cooking vessels or the storage of specific types of foods in different areas of the compound. In addition, when households use ceramic vessels for different types of functions than their intended or primary function, the spatial location of specific vessels may reflect their secondary or tertiary function. The mapping of the spatial location of ceramic vessels and correlating this with their observed uses provided a basis for assessing the relationship between ceramic use and space. I focused on the spatial changes of ceramic forms within household compounds to provide a greater awareness with which we can infer different ceramic life-cycles.

Vessel Frequency and Size

My research among the Gamo also focused on vessels used throughout their life-cycle from three villages and different caste and economic households to help to clarify the factors that affect the relationship between the household's ceramic assemblage and population. Once archaeologists are able to interpret different stages

of the life-cycle of pots, they may be able to determine accurately prehistoric and historic demography. Intervillage variation between vessels and population has not been studied previously and only one study (i.e., Nelson 1981) has addressed the relationship between vessel volume and household population when controlling for socioeconomic variation. However, caste variation between vessels and population has not been studied previously. Exploring the association between household population and the number and size of pots throughout the different life-cycle stages provides valuable information concerning how to analyze household pots as an indicator of household population. Vessel volume is often employed to determine household population (Nelson 1981; Tani 1994; Turner and Lofgren 1966). Investigating the relationship between household population of a village with vessel volume was first conducted by the classic study of Turner and Lofgren (1966). They examined Anasazi sites in the American Southwest that were occupied for an 1100-year period. They found that household populations could be correlated with the volume of cooking vessels (Turner and Lofgren 1966). Turner and Lofgren's (1966) study was tested in ethnographic settings among the Maya in Mexico (Nelson 1981) and the Kalinga in the Philippines (Longacre 1991; Tani 1994).

Tani's (1994) study comparing household size and vessel volume was in agreement with Turner and Lofgren's (1966) analysis, showing a significant correlation between the mean volume of regular-sized cooking vessels and household population. In contrast, Nelson's (1981) study indicated that specific cultural cooking activities can affect the relationship between the members of a household and their vessel volume. In addition, his study correlating household volume with population

found that status was a major influence on whether pots correlated with household size (Nelson 1981). This is partly due to higher status households conducting feasts sometime in the past, causing them to have an excess number of large vessels within their household assemblage (Wilson 1994:55). Nelson and colleagues (Nelson 1981; Nelson et al. 1994) suggest that researchers look at different villages within a society and study a community where each household produces its own pottery.

Longacre's (1991) and Tani's (1994) studies indicate that the number of household pots among households that produce their own pottery does not correlate with household size. Furthermore, Tani (1994) found among the Kalinga that larger household populations use larger cooking vessels. The reason these populated households have more broken pots is because large pots break more often due to the amount of thermal stress placed upon large cooking vessels (Tani 1994).

I investigated the associations between Gamo populations and the frequency and sum and mean volume of different functional vessels among the three villages and different caste and economic ranked households. I expected that the population of a Gamo village would correlate with frequency and sum and mean volume of the village household's ceramic vessels. This would seem to be especially true for cooking vessels, because cooking pots are a direct tool for providing the members of the household their daily food. Serving vessels are expected to have a strong association with the number of people eating from a given household, because the Gamo serve food communally. In addition, storage and transport vessels are tools that reflect the needs of a given household population, and I expected that these functional vessels would provide a strong association to the population of households. However, if non-

pottery-producing villages are found to stockpile their pots, then this may indicate a strong negative association between a village population and their vessels. Furthermore, I expected that high caste or wealthy households will have a weaker association between their household population and their pots because they may have an excess amount of vessels than the population requires.

Use-life

The final analysis is vessel use-life and the influence that production techniques and materials, vessel cost, size, and function have on the longevity of pots within different villages and castes and economic rank households. The study of ceramic use-life from villages around the world remains an important methodological tool for interpreting the frequencies of types in the archaeological record. The variation of use-life among different types allows archaeologists to suggest the duration of occupation and population of a site (Foster 1960; Longacre 1985; Rice 1987:300). Researchers have gathered use-life information from 18 different ethnic groups that vary in terms of the longevity of functional classes of pots. Many factors can affect the use-life of a pot including household size (Tani 1994), vessel size (Birmingham 1975:384; David and Hennig 1972; DeBoer 1985; de la Torre and Mudar 1982; Longacre 1985:340; Shott 1996), production methods (see Chapter 4) (Arnold 1991:72; Bankes 1985:275-276; Deal 1983:155; Foster 1960; Okpoko 1987:452), and use (Bankes 1985:72; Foster 1960; Reid 1989; Tani 1994). This previous research concluded that cooking vessels and small pots moved from location to location have a shorter use-life than storage vessels and large pots that remain in one locality (Longacre 1985).

The frequency of use is a factor that influences a vessel's longevity, especially for cooking and serving vessels that tend to be used with more frequency than other functional types (P. J. Arnold 1991:72; Deal 1983:155-156, 1998:92-93; Foster 1960:608; Rice 1987:298). Although the role of socioeconomic status is mentioned as a factor that influences ceramic use-life (e.g., Rice 1987:300; Shott 1996:480), I am not aware of any studies that directly address the relationship between socioeconomic status and ceramic use-life.

With the Gamo, I expected that production techniques and vessel cost, size, and function will affect vessel longevity. Specifically, potters who use better materials and techniques, based upon consumer opinions, should have vessels that have a longer use-life. In addition, potters who sold expensive pots should produce pots with a longer use-life. A household's social and economic status may also contribute to the types of vessels that a Gamo household could afford. Cheaper and poorly manufactured pots purchased or exchanged by low caste and poor households may have a shorter longevity. Previous research (David 1972; DeBoer 1985; Longacre 1981:64; Shott 1989; Tani 1994:62) shows that larger vessels are used less and have a longer use-life. Therefore, I also expected that larger vessels should have a longer use-life than smaller vessels. In addition, the function of the vessel should influence vessel longevity, in that cooking, serving, and transporting vessels would have a shorter use-life than storage vessels. The frequency of pots used among households may also influence their use-life. If the poorer and low caste households have fewer pots at any given time, then they are expected to use them with more frequency causing them to have a shorter life expectancy. Furthermore, the factors that affect a vessel's use-life

are influenced by the distribution of pots throughout the Gamo landscape; therefore, intervillage comparisons should demonstrate the link between vessel distribution and longevity.

From the preceding discussions, it should be clear that ethnoarchaeological research has the potential to make a substantial contribution to ceramic studies, especially where the researcher observes the life-history of specific ceramic vessels in different social-economic households located in distinct villages. The study of Gamo ceramics importantly demonstrates to archaeologists the possibility of deriving social and economic information from pottery. As will be shown, an ethnoarchaeological study of Gamo ceramics can provide archaeologists with a more concise framework in the processes contributing to the behavior behind the variation and distribution of archaeological household ceramics.

Organization of the Following Chapters

The parable at the beginning of this chapter tells us the social and economic story of a Gamo potter and points to the life-history of pots. From the time the potter produces and distributes her pots and the consumers use and discard their pots, each pot moves through a range of social and economic contexts that help to define Gamo society. As the parable presents a society that is rich in intervillage and socioeconomic variation, it is my goal to present a model to archaeologists demonstrating that this variation can be interpreted in the archaeological record.

To understand the relationship between Gamo pottery and its role in contributing to archaeological interpretations of social and economic variation it is

necessary to discuss Gamo society. Chapter 2 discusses the Gamo people, relating how their political organization, castes, economic wealth, markets, agriculture, and diet influence their household ceramic assemblages.

Chapter 3 details the methods I used to gather my information among the Gamo and their pottery. The importance of using the life-cycle approach is explained, and it is argued that the life-cycle provides a more complete analytical tool in explaining how to interpret socioeconomic variation in the archaeological record. The three units of analysis, village, caste, and economic rank, are described concerning how and why specific villages and households were included as part of the research.

In Chapter 4, I begin with a discussion of the variation concerning Gamo pottery procurement and production, as well as the technological, social and economic factors influencing ceramic distribution at the village, caste, and economic wealth contexts. This chapter investigates the consumers' opinions concerning different Gamo potters ability to produce pots and tests if their opinions are reflected within their household assemblages. Furthermore, I compare the cost and types of pots household's purchase based on their social status and economic wealth.

In Chapter 5, I look at factors influencing how Gamo villages, castes, and economic ranks use, reuse, and discard their ceramic pots. The ecological location among the three villages is an important component concerning the types of vessels potters produce and consumers use. Furthermore, this chapter investigates whether the household assemblage is representative of the level of caste and economic rank. Specifically, I compare the different caste and economic rank households in the three

villages concerning the frequency of vessels and vessel types, sum volume, and the percentage of vessels used for the processing of high cost foods.

Chapter 6 discusses ceramics in terms of spatial and use-alteration analyses during the primary-use, reuse, and discard stages. This chapter focuses on how people change their storage of ceramic pots within villages, castes, and economically ranked households. In addition, I explore how use-alteration attributes such as carbon deposition and surface attrition indicate how the Gamo people use their different vessel types.

Chapter 7 details the correlations between the frequency and volume of pots with household population, and the various factors that affect the longevity of pots. I demonstrate that within the contexts of village, caste, and economic wealth there are differences in how pots reflect household population, especially as pots move from primary-use to their discard stage. Furthermore, I explore how vessel use-life at the village, caste, and economic wealth contexts are affected by factors such as vessel volume, function, and cost, as well as their frequency of use and the potter's production methods.

Finally, Chapter 8 summarizes the results of the analysis discussed in the dissertation. Based on the success of the research, I present avenues for future ethnoarchaeological and archaeological research in southwestern Ethiopia.

CHAPTER 2
THE GAMO

This chapter places the Gamo people in perspective by outlining their culture and explains why they are an excellent model for understanding the relationship between household ceramics and social-economic variation. The Gamo provided motivation for this study because among them: (1) pottery is an extremely important material for everyday living and its production and use has not been curtailed by the substitution of metal and plastic vessels; (2) there are two types of Gamo villages including pottery-producing and non-pottery-producing villages; (3) the different castes in Gamo all use ceramics; and (4) ceramic users are found throughout the region encompassing different agricultural subsystems, thus the relationship between the use of ceramic containers and different agricultural foods can be investigated.

The Research Area

The Gamo people of southern Ethiopia, some 600,000 people strong, inhabit the mountains east of the Rift Valley lakes of Abaya and Chamo (Hasen 1996). The Gamo highlands rise from the rift valley lakes at an elevation of 1,160 meters to a height of 3,540 meters at Mount Tola. The dramatic rise of the Gamo highlands from the Rift valley lakes of Abaya and Chamo provides a diversity of ecological conditions that affect regional climates and agricultural potential. The average rural population

density is high, with some places exceeding 200 persons per square kilometer. The Gamo territory and peoples are subdivided into: *deres* or districts, with each *dere* divided into *mota* or subdistricts, and *guta* or villages that are led by elected and hereditary elders (Abélès 1979, 1981; Cartledge 1995; Olmstead 1975; Sperber 1975).

I conducted the majority of my fieldwork in three villages: Zuza, Guyla, and Etello (Figure 2-1). The village of Zuza is located within Zuza *mota* and in Ochollo *dere* on a single ridge overlooking Lake Abaya at an elevation of 2,100 m. The number of households found in Zuza at the time of my census numbered 57, with five households of potters, and the remaining households consisting of farmers and weavers (Figure 2-2). The number of people living in Zuza at the time of my census was 198 people or 3.5 people per household. There were no smiths or hideworkers living in Zuza. Because the village is located on top of the Ochollo ridge, the households are densely concentrated.

The village of Etello is located within Doko Kalay *mota* and in Doko *dere* at an elevation of 2,600 meters. The number of household compounds at the time of my census numbered 68, with three household compounds of hideworkers and the remaining households consisting of farmers (Figure 2-3). The population of Etello at the time of my census was 315 people or 4.6 people per household. There were no potters or smiths living in Etello.

The village of Guyla is located within Leesha *mota* and in Dita *dere*. Guyla is situated at an elevation of 2,700 meters. The number of households (Figure 2-4) in Guyla at the time of my census numbered 91, with 10 households of potters, three

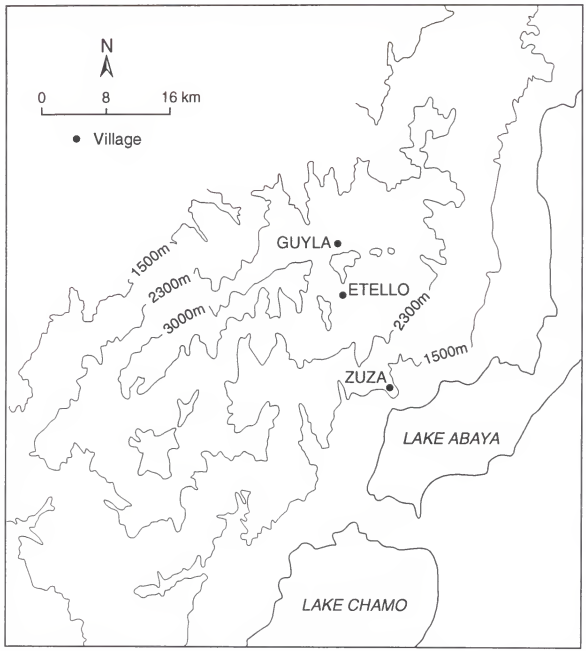

Figure 2-1: Map of the village locations of Zuza, Etello, and Guyla within the Gamo region.

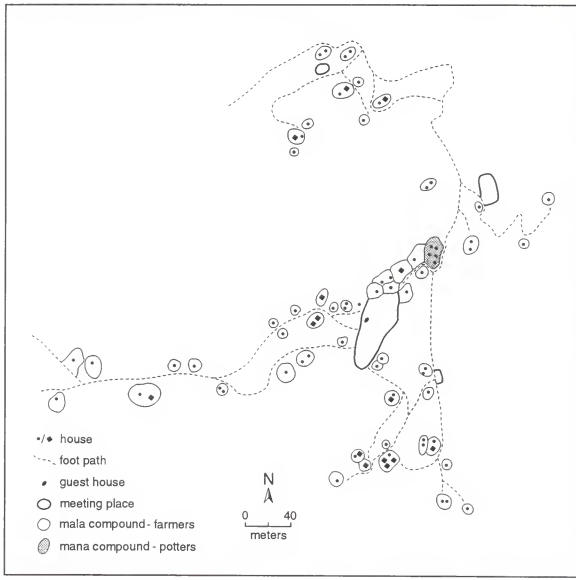

Figure 2-2: Map of households located within the Gamo village of Zuza.

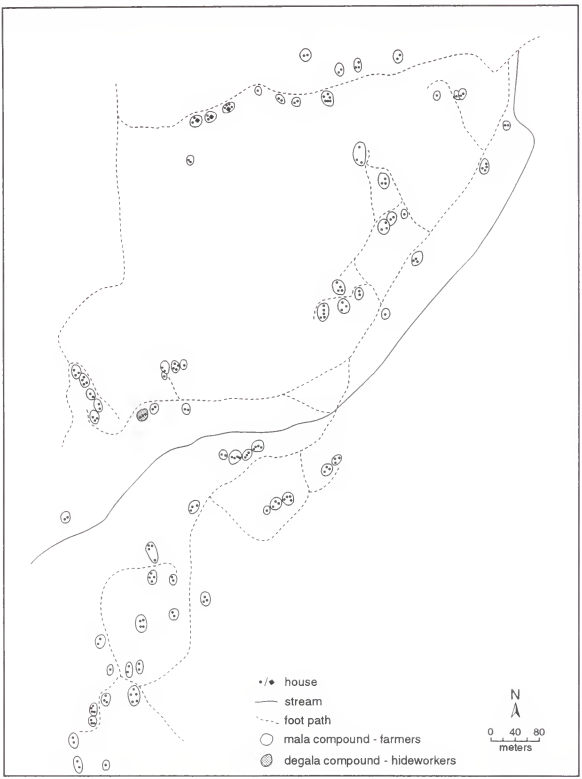

Figure 2-3: Map of households located within the Gamo village of Etello.

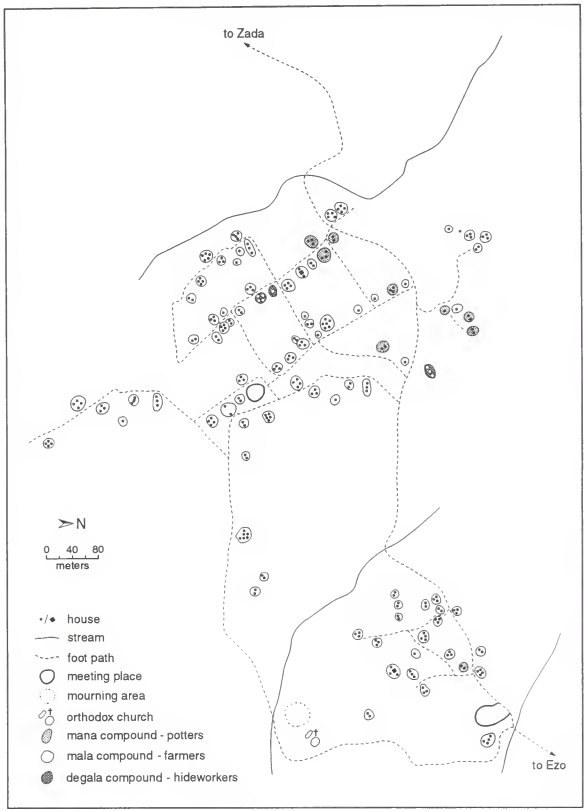

Figure 2-4: Map of households located within the Gamo village of Guyla.

households of hideworkers, eight abandoned households, and the remaining households consisting of farmers. The population of Guyla at the time of my census was 342 people or 4.1 people per household (i.e., not including the abandoned households). There were no smiths living in Guyla.

Political Organization

The Gamo are not an isolated agricultural community, but rather they are incorporated into the larger Ethiopian society, as they were controlled by the Omotic King of Kaffa (Beckingham and Huntingford 1954:LXVI). Then in circa 1897, Menelik II invaded the Gamo, as well as the other neighboring groups, which began the full integration of Gamo society into the Ethiopian Empire (Bureau 1980; Halperin and Olmstead 1976). It is the thought that this influence from the Amhara caused the Gamo to adopt political and social titles such as *Halaka* and *Dana*, which are similar to the Amharic *Aleqa* and *Dana* titles (Bureau 1979). How these outside influences have changed the production and use of pottery in Gamo society is unknown. Gamo potters continually stated that they make the same pottery types as their ancestors. Therefore, only archaeological research can address changes concerning pottery production and use.

Several researchers have studied the contemporary political organization of the Gamo people (Abélès 1979, 1981; Bureau 1978, 1981; Halperin and Olmstead 1976; Olmstead 1975; Sperber 1975). The political leaders in Gamo (i.e., *Kao*, *Dana*, *Maka*, *Uduga*, and *Halaka*) must be *baira*, who is the senior male in his family and sometimes a member of a senior clan, as certain positions come from one clan

(Sperber 1975:212). A *Kao* and other political leaders cannot become a political leader if his father is still alive. Within each of the intraethnic divisions or *deres*, there is a hereditary ritual sacrificer or *Kao*. The *Kao* is a full-time *baira*, who represents his *dere* in *interdere* discussions, in addition to making "numerous propitiatory sacrifices, obey particular taboos, and command special respect" (Sperber 1975:213-214).

The *Dana* is below the *Kao* in the ritual-political hierarchy. The *Dana* must first be a *Halaka*, then an *Uduga* before he is chosen as a *Dana*. A man must have considerable wealth to become *Dana*. The *Maka* is also a hereditary position who sacrifices and prays for the people of his *dere*. Each *Uduga* is chosen yearly and his duties are to collect taxes and govern the people.

The *Halaka* has received the most focus from previous researchers (Abélès 1978, 1979, 1981; Freeman 1997; Halperin and Olmstead 1976; Sperber 1975). The majority of Gamo *Halakas* are from the caste, *mala*. However, some of the regions inhabited by *mana* and *degala* castes have their own *Halakas* that represent only the *mana* or *degala* people (see Caste section below). A *Halaka* has been described as a man appointed by district assemblies and must be circumcised, married, wealthy, and morally respected (Sperber 1975:215). However, Freeman (1997) states that "a *Halaka* is an initiate, and that he is being initiated into the community as a full member" (351). *Halakas* usually wish the appointment did not occur because becoming a *Halaka* requires a substantial amount of resources, however it is taboo to refuse (Sperber 1975:215). The reason becoming a *Halaka* is an expensive exercise is because he must give a series of feasts, one at his house and the other in the area of community gatherings or *dubusha* (Freeman 1997:352). The last feast occurs when the *Halaka*

becomes an *ade* or *Halaka*-as-man, where he provides a feast or senior's feast (*baira musa*) for four days that consists of beer and ceremonial Gamo foods (Freeman 1997). Pottery is an integral material for conducting *Halaka* feasts, as it is the use of ceramic vessels that helps ferment the beer and cook the food given to the feast's participants. In addition, ceramic vessels generally are used to serve the food at the feasts, especially since people eat communally from large serving bowls.

After 1974 when the Marxist government came into power, many of the traditional Gamo political institutions were forced to relinquish power. In Zuza and other villages, the presence of ritual-political leaders and their associated wealth affects the types and the number of pots present within their households. According to oral history, the Argama clan first inhabited Zuza, which was the first village inhabited in all of Ochollo *dere*. There is only one *Kao* living in Zuza, whose responsibility it is to speak first at meetings held at Bakero (i.e., the Zuza *debusha* or gathering place), where all of Ochollo meets. This is the only responsibility for *Kao* Bulche, because the responsibility of the *Kao* in Ochollo has diminished. After *Kao* Bulche's father died in 1960, *Kao* Bulche became Ochollo's *Kao* and had a feast for all of Ochollo. However, after the Marxist Government took over in 1974, *Kao* Bulche was forced to relinquish his role as *Kao* in Ochollo *dere*. There are three former *Halakas* living in Zuza, but at the time of my research, no one in Zuza was being initiated into becoming a *Halaka*. In addition, there are no *Danas*, *Makas*, or *Udugas* living in Zuza. I interviewed and studied pottery of one *Kao* and three *Halaka* households in Zuza.

In Etello, there are no *Kaos*, *Danas*, or *Udugas*, whereas there are six former *Halakas* and one *Maka* living in Etello. In Doko *dere*, where the village of Etello is

located, the recent *Dana* gave the people 10,000 birr, which is the equivalent of 99 ox. The length of the *Dana's* term is dependent upon whether there is another person who is qualified and has the wealth to donate either the ox or the money to the people. The previous Doko *Dana* was *Dana* for 28 years until his death. The first people to inhabit the village of Etello were from the *Maka* clan and this is the reason the *Maka* comes from this clan. In Etello, the *Maka* explained that he has been a *Maka* for seven years and when he became *Maka* by the people's wishes, he was given an ox from the seven *Halakas* of the *dere*. In addition, every year for seven years the seven *Halakas* give the *Maka* an ox, which they take to Tsudo Mountain in the forest. In the forest they slay the ox and pray to God that the seven *motas* in Doko will be productive and the people will have peace and health. In addition, they eat *gordo* (see Gamo diet below for description) that is given by the *dere's Uduga*. Currently in Doko, the *Uduga* no longer collects the people's taxes. I interviewed and studied the pottery of one *Maka* and two *Halaka* households in Etello.

In the village of Guyla, which is located in Dita *dere*, the only leaders present are six former *Halakas*. The people of Guyla repeatedly stated that they do not have enough wealth for someone to become *Halaka* in Guyla. However, there was one recent initiated *Halaka* living in a village adjacent to Guyla. In Leesha *mota*, the first people inhabiting the area were from the Gawmala clan and this is the reason the *Kao* of Leesha is always from the Gawmala clan. However, it is not known which clan first inhabited the village of Guyla. There are presently no *Danas*, but in the past, the *Dana* came only from Leesha and his duties were to collect taxes. Presently in Leesha, there is a *Maka* and his duties are to lead the people to the *debusha* Lalume that the people

consider an honored place. Lalume is an open field and when people are walking through Lalume to the market, people sit for a short time in respect to this honored land. The *Uduga* in Leesha is from the clan Galomala and his duties are to pray for the people and during *Meskal*, he sprinkles honey in the Leesha market. I interviewed and studied the pottery in two *Halaka* households in Guyla.

Castes

There is a debate concerning whether castes exist in Africa, as some researchers argue that castes can only be applied to southern Asia where it is associated with the Hindu religion (Dumont 1957; Leach 1962). However, others have clearly demonstrated that castes are not confined to southern Asia, but are present in many regions of the world including Africa (Haberland 1984; Hocart 1950; Hutton 1963; Levine 1974; Lewis 1970; Maquet 1970; Shack 1964, 1966; Sterner and David 1991; Vaughan 1970). Specifically, a debate concentrates on whether the theory of castes can be applied to Ethiopian societies, in terms of their origins and present-day classification. Three alternative theories have been proposed to explain the origin of caste groups in Ethiopia: (1) the remnants theory (Cerulli 1956; Clark 1954; Haberland 1984; Honea 1958; Jensen 1959; Shack 1966:9); (2) the mutualistic specialization theory (Levine 1974); and (3) the internal social differentiation theory (Todd 1978). Proponents of the remnants theory state that pre-Cushitic groups of hunters and artisans were remnant groups of foragers. According to the proponents of this theory, these hunter and artisan groups exhibit a different phenotype than their host group (Fleming 1973, 1976; Orent 1969; Shack 1966:9). Levine's (1974)

mutualistic specialization theory contends that groups of specialized artisans were incorporated into the larger society because there was a continuous demand for these crafts. Todd's (1978) internal social differentiation theory is based on his research among the Dime of southwestern Ethiopia. He believes that among the Dime, surplus food was present, causing groups of people to develop specific artisan skills, who worked for the Dime chiefs.

There is no single defining theory of castes, as each society, whether it is in India or Ethiopia, has its own specific structure for integrating castes into its larger socioeconomic order. Therefore, to state that caste can be applied only to the borders of Pakistan and India not only denies cultural complexity, but also molds each society into the same caste system. The difficulty in presenting a clear definition of a theory of caste is that caste is dependent upon spatial and temporal context, thereby making it difficult to proceed with a generalized notion of how to define castes. Although characteristics of castes can be refuted based on different contextual information, certain attributes are more clearly applicable than others. The strict rule of ascribed birth is an important attribute of caste, because it provides the foundation of kinship and marriage relations throughout India. Related to the concept of endogamy is the importance of pure and impure relationships that occur among all members of society. Purity and impurity are established in everyday affairs of eating and socializing, which influence important ceremonies such as marriage and death. Occupation is associated with castes but as mentioned above it must be used cautiously, since not all members of a caste may be closely tied to a specific occupation. A caste is an endogamous group that is part of a larger society that ranks members on a hierarchical scale. It is

also associated with purity and impurity and each caste has its own perceptions and traditions associated with the caste system.

The northern and central regions of Gamo have a social organization that entails a rigid caste system consisting of three castes, in order of rank: (1) *mala*; (2) *mana*; and (3) *degala*. In the southern Gamo region, there are only two castes, *mala* and *mana*. The *mala* caste is the highest status caste group. The *mala* caste controls the Gamo political, economic, and religious systems. They are associated with farming but also are merchants. The majority of weavers belong to the *mala* caste but it is possible for both *mana* and *degala* caste members to learn to weave. The *mana* and *degala* castes have no political control in Gamo society except some *mana* and *degala* members will choose their own *Halaka* (village sacrificer), but this *Halaka* does not have the political influence that the *mala Halaka* has. The *degala* caste is the lowest status caste group and are associated with iron-working, hide-working, and ground-stone manufacturing occupations (Table 2-1).

Each caste is endogamous and there are strict taboos against engaging in sexual intercourse, living, eating, or marring someone from another caste. If a taboo is broken, then the parties are ostracized from society. In addition, it is thought that if a person from the *mala* caste has sexual intercourse with either a *mana* or *degala* member, death will occur for both individuals. Presently, this taboo is strictly enforced as I witnessed when a *Halaka* verbally assaulted the husband of a *mana* woman because his wife became drunk and began to flirt with members of the *mala* caste. As the *mana* husband stood and held the *Halakas* staff, the *Halaka* took grass from the potter's compound and threw into the air indicating that he has blessed this land and

stated that his family had given this land to the *mana*. The *Halaka*, as well as other past *Halakas*, ordered her temporarily to leave the village as part of her punishment.

Table 2-1: Social hierarchy and their economic associations in Gamo society.

Caste with Possible Social Leaders	**Possible Occupations within Caste**
mala	
Kao	Farmer
Dana	Merchant
Maka	Govt. Official
Uduga	Weaver
Halaka	Cotton Spinner
	Market Carrier
mana	
Halaka	Potter
	Farmer
	Weaver
	Cotton Spinner
	Market Carrier
degala	
Halaka	Hide-worker
	Smith
	Ground-stone producer
	Farmer
	Weaver
	Cotton spinner
	Market Carrier

One's caste membership in Gamo is ascribed at birth and there is nothing that one can do to change her/his status. The *mala* caste members are farmers, weavers, merchants, elected officials, and sacrificers. The *mana* caste members are predominantly potters. Potters are full-time craft specialists who live in specific villages throughout the Gamo region. Thus, some villages and regions have no potters

and these differences between villages affect the distribution and use of a village's ceramic assemblage. The location of *degala* members is dependent upon their social relations with farmers in order to be granted permission to live in a village. The groundstone producers also must live in an area that is geologically suitable for them to mine particular types of stones.

Some *mana* households own land that they either obtained from the *mala* caste or received from the Marxist government that took over political control Ethiopia in 1974. However, some *mana* families do not own farmland and must rely solely on the manufacture of ceramic vessels for their livelihood. In the past, the *degala* were not able to own farmland. However, since 1974 with the takeover by the Marxist government, some *degala* families have gained access to farmland. In 1991, when the new Ethiopian government took control, the Gamo began to reinstate their traditional ideals resulting in some *degala* families losing their farmland.

In Zuza, there are only *mala* and *mana* castes. Five households of the *mana* caste live within one area with a population of 23 or 4.6 people per household, and the rest of the village households (n=52) belongs to the *mala* caste with a population of 175 or 3.4 people per household (Figure 2-1). In Etello, where the *mala* and *degala* castes are represented, there are three *degala* households living in one area with a population of 11 people or 3.7 people per household. The rest of the Etello population (n=65) belongs to the *mala* caste consisting of 304 people or 4.7 people per household (Figure 2-2). In Guyla all three castes are represented: there are three *degala* consisting of 13 people or 4.3 people per household and ten *mana* compounds scattered throughout the village, which represent 47 people or 4.7 people per

household. The remaining households of Guyla (n=70) are inhabited by the *mala* caste, which has a population of 282 or 4.0 people per household (Figure 2-4).

Economic Wealth

Wealth in Gamo society is dependent upon the household's developmental cycle, as well as one's social placement. As discussed in Chapter 1, social status and wealth are not isomorphic, as a household's economic wealth may be higher than another household that may belong to a higher caste. For example, some potter households do not have farmland, but because there are a number of people generating income, they are economically wealthier than households inhabited by *mala* widows. Thus, the developmental cycle in terms of who is living within the household and their associated occupation(s) directly affects its economic status.

Among the Gamo, the wealthiest households generally belong to the political elite such as the *Kao*, *Dana*, *Maka*, *Uduga*, and *Halaka*. However, some of these titles indicate social and political roles rather than economic wealth. The *Kao*, *Uduga*, and *Maka* sacrifice animals for the well being of the people that live in their *mota*. Whereas the *Dana* and *Halaka* must pray for their people, they also must give feasts that require substantial wealth.

The Gamo people assess the wealth of a household in terms of: (1) the number and quality of house construction; (2) the amount of land farmed; (3) the type and number of livestock owned; (4) the number of wives that a man has; and (5) the type and number of occupations people are engaged in. These emic factors are the basic tenets of whether a household is wealthy or not. All three villages have households

that represent the various economic ranks, with Guyla having the wealthiest households among the three villages.

Markets

Gamo markets are an extremely important part of Gamo life, not only in terms of dispersing goods throughout the landscape, but also in providing a setting for Gamo people to engage socially. Although it is not known how long Gamo markets have been a formal part of everyday life, Jackson (1970) believes that the specialized markets that make up the largest markets came into being during Menilik's occupation of the region and therefore are a relatively new aspect of their society.

Presently there are two types of markets in Gamo. The local market is visited by people living within a *mota*/subdistrict. Here, potters from the region sell to their patrons, either new patrons or patrons that have been purchasing or exchanging food with specific potter families for generations, such as the case with the market in Leesha. The larger markets of Zada, Ezo, Tuka (Chencha), Bodo (Dorze), Ochollo, and Lante (Figure 2-5) are open on different days and staggered, so that they do not interfere with each other. However, the Ezo and Bodo markets fall on Monday and Thursday, but they both specialize in different materials. Bodo is known for its cotton, as many of the weavers live in and around Bodo. Ezo, however, is known for its pottery, because Birbir potters sell there, as well as potters from Zada, Leesha, and Borada. In addition, Ezo is known for selling high quality milk, which Jackson (1970)

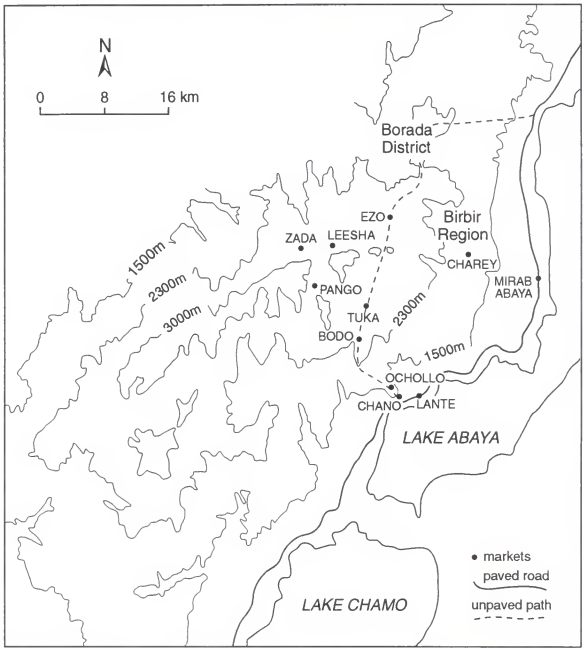

Figure 2-5: Map of markets located within the Gamo region, which are associated with the villages of Zuza, Etello, and Guyla.

also documented thirty years ago. Tuka's (Chencha) market has a variety of materials present, but it specializes in selling foods from the lowlands (e.g., bananas, maize, sweet potatoes, teff, etc.) and highland crops (e.g., enset, barley, wheat, potatoes, cabbage, etc.). In addition, potters from both the lowland and highland areas sell at Tuka.

Ochollo's market is adjacent to Zuza and specializes in maize and cotton, as does the Lante market. In addition, the Ochollo potters sell at both the Ochollo and Lante markets, and sometimes at the Bodo markets. The people of Zuza usually visit the Bodo, Ochollo, and Lante markets, which specialize in the selling of raw and spun cotton. Many of the Zuza women spin cotton as a source of income so they are either purchasing raw cotton and/or selling their spun cotton to weavers living throughout the region.

Etello is centrally located near many of the important Gamo markets. They visit the Tuka, Bodo, Pango (Doko Mesho), and Ezo markets. However, the Tuka and Pango markets are the most common markets visited because of their size and proximity. Here they sell and buy agricultural items and purchase ceramic vessels.

The Guyla people visit the Ezo, Zada, Pango, Tuka, and the small Leesha markets. The potters sell their wares at the Leesha, Pango, and Zada markets, but sometimes sell at the Tuka and Ezo markets, as well. The markets are the link between pottery producers and consumers and determine how pottery is dispersed over the landscape, since it is the markets where potters and consumers sell and purchase their pots.

Agriculture

Agriculture is the primary occupation for the majority of Gamo people. The Gamo region is extremely mountainous and the production of agricultural crops corresponds to distinct ecological zones governed largely by altitude. The Gamo highlands have three major altitudinal agroecozones traditionally identified in Amharic (the national language of Ethiopia) as: (1) *woyna dega*, 1,500 to 2,300 m; (2) *dega*, 2,300 to 3,000 m; and (3) *wurch*, above 3,000 m (Cartledge 1995). However, the Gamo classify two distinct ecological zones, the *dega*, considered the highland region located between 2,300 and 3,000 meters, and the *baso* , the lowlands situated between 1,500 and 2,300 meters. These agroecozones vary in their annual amount of rainfall that are dispersed over two biannual rainfall periods. The small rains occur from March to May and the big rains occur from June to September, but it is also possible for the small rains to merge into the big rains, causing continuous precipitation from March to September (Westphal 1975:22). It is during the big rains that pottery production is slowed because potters are not able to extract their clays, dry and fire their vessels.

Within these altitudinal zones, different types of crops are grown. In the *Baso* zone, the principal crops are wheat (Triticum savitum), an indigenous Ethiopian grain called teff (Eragrostis teff), maize (Zea mays), and coffee (Coffee arabica). Secondary crops include enset (Ensete ventricosum) and barley (Hordeum vulgare). Enset is an indigenous Ethiopian crop that is a large fibrous-leaf plant with the edible portions consisting of the roots, pseudo-stems, and leaf-stems (Brandt 1984; Brandt et al. 1997; Olmstead 1974). Enset (Ensete ventricosum) is an endemic plant of Ethiopia that is

farmed throughout southern Ethiopia. Enset is grown in every ecological zone from 1,200 to 3,100 meters (Brandt et al. 1997:5). Many researchers believe that southwestern Ethiopia was possibly the region where people began domesticating enset (Brandt 1984, 1997; Brandt and Fattovich 1990; Harlan 1969; 1992; Sauer 1952; Shack 1963; Simoons 1960; Vavilov 1926). However, no archaeological research to date has been conducted in the region to understand the development of enset and other types of food production.

In the *Dega* zone, where the majority of people live, enset, barley, and Ethiopian cabbage (Brassica integrifolia var. carinata) are the primary crops. Secondary crops include Oromo potato (Coleus edulis L.) and castor bean (Ricinus communis L.).

Zuza is located at an elevation of 2,100 meters. The only agriculture that occurs in Zuza is garden plots that have a mixture of enset, corn, cabbage, and peppers. There is not enough land in the village to have large-scale agriculture, so the majority of land used for agriculture by the Zuza people is located away from the village. Weaving and spinning cotton are two common types of work conducted by the people. Likewise, the owning of livestock was minimal compared to the other two villages that I studied.

Etello is situated at 2,600 meters within a large valley where the Itsamighty River provides enough well watered land to conduct large-scale agriculture. The majority of households are situated adjacent to the Itsamighty River, where the village drinking water is gathered. Except for the hide-workers, farming is the main occupation of the village, with weaving and spinning cotton providing secondary

occupations. The crops grown in Etello are barley, wheat, enset, potatoes, cabbage, peas, and beans. In addition, the majority of people in Etello own some livestock.

Guyla is situated at 2,700 meters on the upper slope of a large valley providing enough land to conduct large-scale agriculture. Guyla is located on a well-drained mountainside where several small streams provide ample drinking water. The majority of household compounds are situated in a grid pattern with footpaths running throughout. Except for the artisans, farming is the main occupation of the village, with weaving and cotton spinning providing secondary occupations. Guyla is similar to Etello in the types of crops grown and amount of livestock owned. The types of agricultural products greatly affect the types of pottery used throughout the household. This association between agricultural crops and pottery types also influences which vessel types potters specialize in because of the demand by consumers.

Diet

There is a strong association between the use of pottery and food in Gamo society. Different ceramic vessel forms are used to process a variety of Gamo foods for everyday consumption. Before discussing Gamo ceramics and their role in demonstrating regional, social, and economic conditions, an understanding of the basic types of foods eaten in Gamo society is necessary.

The Gamo diet consists of a range of foods, but depends, in part, on the seasonal availability of specific crops. As mentioned above, if people have the economic means, they can purchase foods that are not grown near their village from one of the many weekly markets dispersed throughout the Gamo hinterlands. The

majority of meals eaten throughout the Gamo region are made with enset, which is available throughout the year. Different parts of the enset plant are processed and prepared for making specific meals, which can be fermented, boiled, and/or roasted. One of the most common foods is the corm of a young enset plant. They prepare the enset corm by cutting it into a number of pieces and boiling it (*chaday*) usually with either cabbage or potatoes; also garlic and/or onions may be mixed into the cooking pot. Another common type of meal is prepared by fermenting enset by burying it for seven days then trampling it with the feet and then burying it again for another seven days. After two weeks, the enset has fermented and is made into bread that is cooked or mixed with a combination of grains (e.g., barley, wheat, maize, or sorghum) to make *ooetsa*. All breads are cooked on the ceramic baking plate (*bache*) (see Chapter 4). In addition, *enchila* (highland name) or *kashca* (lowland name) is made with fermented enset (*zaluma*) by mixing with barley, wheat, maize or sorghum flour. The *enchila/kashca* are formed into oval shapes, and to prevent them from sticking to the vessel wall the cooking pot is lined with enset leaves. Another form of food prepared with enset is *patella* that is made from the scraped enset and cooked with salt and cabbage or potatoes that is boiled using Gamo cooking pots. *Etema* is another type of food made from the enset plant and is a white paste that is produced by squeezing the liquid out of the enset pulp. The *etema* is considered the most prized part of the enset plant. It is eaten at special occasions, including births, feasts, and circumcisions (Cartledge 1995:187). *Etema* is an important component of the pottery production activities after the vessels are fired (see Chapter 4).

As mentioned above, grains such as barley, wheat, maize, teff, flax, and sorghum are grown and eaten by the Gamo. In the highland areas, most meals are made with barley and wheat, whereas in the lowland areas, maize and sorghum are more common. Barley is considered the *baira* of cereals because of its importance in traditional rituals, but wheat is a close second because of its use in Christian rituals (Sperber 1975:212). An important grain food prepared and eaten during the religious holidays of Meskal and Easter is *gordo*, which is similar to porridge. In addition, *gordo* is prepared for *Halaka* feasts. Barley is used only in the preparation of *gordo* for which preparation is intensive. First, the barley must be pounded with a pestle in a wooden mortar to remove the husk. Then the barley is ground three or four times on a grinding stone to produce coarse flour. Every time the barley is ground on the grinding stone, it is sieved through a small woven basket (*zazarey*). After the barley is made into flour, water is boiled in a cooking pot and milk and a small amount of the flour are added and stirred with a bamboo stick. Eventually all of the flour is added and it is cooked for approximately one hour. Then the *gordo* is taken out of the cooking pot, placed in a large serving bowl, and mixed with butter. One of the most common forms of preparing and eating grains is by roasting them (*shasha*) and serving them in a ceramic bowl with coffee.

Meat is not a common food for the rural Gamo people, but is an important food during religious holidays. Different animals are eaten during different holidays. A bull is purchased communally by several families and killed by the oldest *baira*. The meat is usually prepared as a spicy stew (*ayshow wat*) or eaten raw with butter and spices. Chicken is eaten at Christmas and Easter in the form of a spicy stew (*cutoe wat*). Meat

is an expensive item of the rural people of Gamo, and even during religious holidays, the artisans usually can not afford to purchase meat. It is customary for the farmers (*mala*) to give the hideworkers (*degala*) the cow's head during Meskal. If the artisans do not receive meat from the farmers, then they usually will purchase with other artisans a bag of barley or maize, which they will prepare and eat together.

Butter in Gamo society represents a direct measure of status and wealth and is directly tied to Gamo symbolic life. Households that own cows are the main producers of butter in Gamo villages. Milk is transformed into butter by using a large pottery jar (*otto*). The milk is separated after one week, with the thick curd placed in the jar and then the jar orifice is securely covered with enset leaves. The jar is rocked back and forth in the compound for approximately 8 hours. Potters make a small dimple in the upper portion of the jar's neck so that the consumer can punch this dimple out and use it to see when the milk has changed to butter. Butter in Gamo society is used during both life and death ceremonies (Freeman 1997; Olmstead 1997:41, 49, 144-145; Sperber 1974:60-61). When the *Kao* of Dita died in the 1920s, butter was placed on the *Kao's* head and people from Dita brought milk and butter to the *Kao's* relatives (Olmstead 1997:41). Butter is place on the head of *Halakas* during marriage and *Halaka* initiation ceremonies. When *Halakas* have authority over the *dere,* they wear butter on their heads.

Other types of foods that are cooked individually or in combination with other foods are cabbage and potatoes. Whereas cabbage and potatoes represent lower-income foods, the production and consumption of butter (*oysa*), beer (*farso*), and coffee (*tukay*) represent foods that are associated with wealth, high status households.

Beer is produced using a number of different grains such as barley, wheat, or maize. The grain is ground on a combination of grinding stones, with the flour placed in a large serving bowl (*shele*). First, water is boiled in a large cooking jar and the boiled water is poured over the flour and stirred in the large serving bowl and left to cool. Then it is poured into the largest storage jar (*batsa*) to ferment for five days. It is then ready to be consumed.

Coffee is made by roasting the beans on a ceramic baking plate (*bache*) and then grinding them in a mortar or on a grinding stone. Water is boiled in the coffee pot (*jebana*) and the ground coffee beans placed into the coffee pot that sits over the hearth. It is traditional in Gamo society to add salt to the coffee, instead of sugar. In addition, it is customary for a person to be served three cups of coffee in one sitting.

Food such as enset, potatoes, bread, *shona*, and *chaday* are spiced with a liquid spicy sauce (*datsa*), which is a combination of garlic, ginger, onion, red chili peppers, and salt. These foods are ground intensively on a special small grinding stone and put in a small ceramic jar with water or milk. This jar is then sealed with an enset leaf. *Datsa* is used when eating the foods mentioned above. Peas and beans are also common forms of food in the Gamo diet. A light boiling of peas and beans served with coffee in a small serving bowl is especially common. Another form of preparing beans and peas is called *eretza*, which is made by roasting them separately on a ceramic baking plate. After they are roasted they are mixed together and ground four times into a porridge. Then they are boiled with water and milk, added to the above ingredients, and cooked for 10 minutes.

The foods prepared in Zuza households reflect Zuza's ecological zone. Meals in Zuza consist of enset, sweet potatoes, cabbage, maize, and sorghum. In Etello and Guyla, located in the highland region of Gamo, meals include enset, potatoes, barley, wheat, beans, and peas. However, households can vary their diet by visiting markets and purchasing foods not grown locally. In addition, the types of foods prepared in each household are a reflection of the household's social and economic status.

Conclusion

The Gamo are a society with complex political, social, economic, and ecological structures that influences every aspect of daily life. Much of what we know about Gamo society occurred only within the last 100 years. Therefore, research must begin to focus on the historical conditions that have influenced changes among the Gamo. In addition, research should include a long-term study among the Gamo documenting the external and internal influences that affected their cultural practices. Within Gamo society, cultural variation occurs between regions, affecting how the society produces, distributes, uses, and discards its household ceramics. Gamo society provides an excellent setting in which to develop an understanding of how variations reflect social, economic, and political diversity in pottery.

CHAPTER 3
A METHODOLOGICAL APPROACH TO CERAMIC ETHNOARCHAEOLOGY

J. W. Fewkes first used the term "ethno-archaeology" in 1900, consciously recognizing that the present is used to help us understand the past (Fewkes 1900). The subfield of ethnoarchaeology as a method has paralleled the theoretical and methodological changes occurring in the larger discipline of archaeology. The study of pottery through ethnoarchaeology has dramatically expanded within the last fifty years. Pots are produced, distributed, used, broken, reused or discarded, and ethnoarchaeologists have witnessed that each aspect of a pot's life-history is dependent upon the other. Recently, ethnoarchaeologists have incorporated this life-cycle approach to provide a more contextual interpretation of how people interact with their pottery (Deal 1998; Schiffer and Skibo 1997; Skibo 1999). Archaeologists and ethnoarchaeologists should address pottery as a complex technology and not oversimplify the variability that occurs between people and their pots (Rice 1996:191). Whether focusing on present or past societies and their pots, researchers should address the regional, social, and economic context of ceramics. It is a life-history approach that I use in this ethnoarchaeological study to understand how the lives of the Gamo people are reflected in their ceramics.

Methodological Approach

Linton (1944), Matson (1965), and Shepard (1956) were the first researchers to discuss pottery in terms of its functional and technological complexity, rather than only addressing culture-historical frameworks from their pottery collections. Subsequently, a number of ceramic ethnoarchaeologists have focused on the life-cycle analysis (David and Hennig 1972; Deal 1998; DeBoer and Lathrap 1979). Although David and Hennig (1972), Deal (1998), and DeBoer and Lathrap (1979) do not use the term life-history, they discuss production, distribution, use, and discard in systemic and archaeological contexts. Schiffer and Skibo (1997:27-50) use the utilitarian cooking pot and its different life-history components as an example for their theoretical position concerning behavioral variation. Although their discussion is specific to the interaction between artisan and artifact, further interactions can be addressed that relate to the interaction between pottery and the user (whether an artisan or not) as well as between the potter and the consumer.

Researchers focusing on ceramic analyses have contributed to an understanding of the interaction among the ceramic life-cycles and socioeconomic identity (e.g., Bey and Pool 1992; Howard and Morris 1981). Following Lemonnier's (1992) discussion of technology as a means for disseminating social identity, Gosselain's (1998:85) research among potters in southern Cameroon stresses the variability of procurement to distribution through what he terms the "*chaîne opératoire*" (i.e., the different stages of the production sequence) to understand social boundaries. These examples illustrate that focusing on the life-history of pots allows

for a more detailed and contextualized interpretation of the people producing, distributing, using, and discarding their material things.

The stages of a pot's life-cycle are intertwined. Each stage of the life-cycle reflects decisions made by specific individuals in society (producers and consumers) and the socioeconomic context of those individuals in a society. For example, the procurement of clays and temper affects the production and in turn affects the strength of the pot and thus its use-life, which eventually affects the discard rate. The consumer opinions concerning which potters produce the best pots can affect the distribution, as consumers may travel to farther markets to obtain specifically made pots. Furthermore, consumers who believe certain potters produce high quality pots may pay more for these pots. Thereby households of different economic wealth and social status may have different ceramic assemblages. These few examples indicate the complexity of pottery, demonstrating the need to study the different components of the life-cycle to interpret a society's social, economic, and regional variability.

Fieldwork among the Gamo

Pottery production and use remain important aspects of many Ethiopian societies, yet there has been little research conducted to date. Previous research among Ethiopian potters includes a brief description of post-firing treatment using milk by Amhara potters (Messing 1957) and a symbolic study of the use of placing pots on the roofs of Konso houses (Shinohara 1993). In addition, Hecht (1969) gives a photographic overview of some of the pottery types that the Museum of the Institute of Ethiopian Studies has in its collection. Lastly, there is a study from Hakemulder

(1980), who as part of the United Nations Economic Commission for Africa studied two villages in the Shoa province to improve the technical and organization of pottery production.

Village Selection

The majority of ceramic research has focused on a single village (Arnold 1993; Graves 1985, 1991; Hendry 1992; Kobayashi 1994; Miller 1985; Nelson 1981; Nickolson and Patterson 1992; Skibo 1992, 1994; Stark 1994; Tani 1994; Trostel 1994). These intravillage studies point to important issues such as the ceramic life-cycle, use-alteration patterns, spatial analysis, household demographics, and use-life that need to be expanded and examined at the intervillage level. Researchers have concentrated on different villages from a single society to better cope with the factors that influence intervillage variation, especially when focusing on the associations between ceramics and population (Nelson 1981; Nelson et al. 1994). Studies involving village comparisons have led to an improved perspective concerning different stages of the ceramic life-cycle and use-life (P. J. Arnold 1991; Aronson et al. 1994; Deal 1998; DeBoer and Lathrap 1979; Gosselain 1998; Hayden and Cannon 1983; Longacre 1985, 1991; Nelson 1991; Reina and Hill 1978). The significance of my ethnoarchaeological research is that it explores not only the life-cycle of ceramics, but how important research issues such as the influx of industrial wares, spatial analysis, use-alteration, household demographics, and use-life relate to the life-history of household vessels. This will provide a model for archaeologists, who seek to understand the social and economic context of a village from household pottery.

The village analysis of household ceramics contributes to an understanding of regional similarities and differences within a single society. Ceramics can help us to decipher inter- and intravillage social and economic organization. Ethnoarchaeological research within a contemporary stratified society not only helps to elucidate intervillage variability, but also clearly adds to the interpretation of household social status.

Zuza and Guyla villages are located in the *Dega* (2300-3000 meters) and *Baso* (1500-2300 meters) ecological zones, respectively, as well as having pottery-producing and pottery-consuming households (Figure 2-1). These two villages enabled me to gather information regarding differences in diet and ceramic use between two villages in different ecological zones and between households with different socioeconomic ranking.

The third village of Etello was chosen because it is a non-pottery-producing village located in the *Dega* (2300-3000 meters) ecological zone (only hideworkers and farmers live in Etello) (Figure 2-1). Thus, my research questions in Etello focused on how a non-pottery-producing village obtains, uses, and discards their household ceramics. The Etello people can purchase ceramics from a number of different potters from other areas at the weekly markets. In addition, my research in Etello may indicate if villages without potters use pottery differently than villages with potters.

The Census and Mapping of Three Gamo Villages

In the first stage of my research, I conducted a census in each of the three Gamo villages, Zuza, Guyla, and Etello. The census was undertaken to understand the

demographic, status, and wealth differences among households in each of the three villages. This consisted of drawing a map locating each household compound and major footpaths, and then a short interview with either the head male or female of each household. One of the most important aspects during this part of my research was that the members of each of the three villages and myself became acquainted with each other. As I learned about their village, they became aware of the purpose and goals of my research, which helped me build a rapport with each of the village households.

After introducing my research to each household, I solicited information about each household, including name, clan, and primary occupation of the head male and female of the household compound, as well as other occupations conducted by household individuals. I also tried to determine how many landholdings each owned and where they are located; the number of houses they owned; the type of crops they grew; where they obtained the majority of their food (i.e., the market or their farm); which markets they went t; and what type and how many livestock they owned. The last part of the census questions pertained to the consumers' opinions concerning Gamo pottery. I asked which pottery they purchased (i.e., village or region) and what they thought was the best village or region for pottery production and why (i.e., answers usually referred to the work, clays, or firing process).

Pottery Census

After the census was completed, I chose 20 household compounds from each village. In each village, I stratified the sample to include the different socioeconomic groups (i.e., elder, farmer, potter, hide worker). At each of the 60 household

compounds, I spent one day recording the complete life-cycle for each ceramic vessel. I interviewed the head female since she was usually the person who purchased and used the vessel. After each vessel was brought out into the compound (if the vessel was too large I would measure and photograph the vessel in situ), I would ask the informant: how old is the vessel; where did you purchase the vessel and which village or region produced the vessel; how much did the vessel cost; is the vessel broken; if the vessel is broken when and how did the vessel break; and how was the vessel used before and after it broke.

Informants were asked specifically where each vessel was stored. The purpose for documenting the storage location of each vessel was to document spatial changes in the location of vessels relative to their life-cycle (use, reuse, and discard) stages. The storage location of each vessel was documented whether the vessel was stored inside a specific building or outside. If the vessel was stored inside a building, then information was gathered as to the function of the building (e.g., kitchen, storage, weaving, or general living) and where in the building each vessel was kept (e.g., rafters, storage room). The storage location for vessels stored outside was gathered as to its specific placement (e.g., adjacent to kitchen or house, enset garden).

I consider primary-use vessels as those ceramic pots that are not broken. Reuse vessels are broken pots that are reused for some function. Provisionally discarded pots are broken and at the time of analysis were not being used for any function nor did the informant have a function in mind for the future. This information provided use-life information for each vessel beginning with its production and ending when the vessel broke or was still being used when the interview was conducted. After the vessel

information was conducted my assistant and I measured and photographed each vessel. Furthermore, the morphology of each vessel allowed for the calculation of the vessel's volume, which was correlated with the household population.

Measurements of the vessels were conducted to understand the formal variability of vessels with their associated functions. Archaeologists use form to infer whether a vessel was used for serving, cooking, or storage (Arthur 1994, n.d., Braun 1980, 1983; Nelson and LeBlanc 1986; Plog 1980; Sassaman 1993; Steponaitis 1983). Each whole and broken vessel also was measured within the household compound for rim diameter (both interior and exterior), rim thickness and height, neck diameter and height, vessel height (both interior and exterior), height from rim to maximum diameter, height from maximum diameter to base, vessel circumference and diameter at the maximum diameter of each vessel, and base diameter at its maximum point. In addition, I documented for each vessel the type of rim (i.e., direct, concave, or convex), the presence or absence of a base ring, handle(s), and interior and exterior decoration. The analysis of vessel form provides information concerning the variability and strength of vessel forms and how they are linked to different uses. The ceramic form measurements provide information about how different settlements and social classes that consist of both non-pottery-producing and pottery-producing households may vary in their use of ceramic vessels. Specifically, based on the measurements from each vessel, vessel volume was gathered, and this was compared to the number of individuals in each household. The formula used for calculating volumes of spherical vessels is $V = 4/3\pi r^3$ (Rice 1987:221). The formula used for calculating volumes of ellipsoid vessels (i.e., *bache* or baking plate) is $V=4/3\pi$Vertical

axis x Larger horizontal axis x Smaller horizontal axis (Rice 1987:221). This type of analysis determines if the sum and mean vessel volume correlated with household population, as some researchers have suggested (Nelson 1981; Tani 1994; Turner and Lofgren 1966).

Observing Ceramic Use-alterations

I conducted the use-alteration analysis during the ceramic vessel census for each of the 60 households in the three villages. The use-alteration analysis allows us to link specific foods eaten by the Gamo to use-alteration attributes. Therefore, the use-alteration analysis provides archaeologists with comparable information in understanding behavior and subsistence in the archaeological record. Before each vessel was measured, I took notes concerning the interior and exterior portions of the vessels. The use-alteration attributes were described for the interior and exterior base, lower body, maximum diameter, upper body, neck, and rim. Photographs were taken of each vessel for which the use-alteration attributes could be documented.

The presence of specific use-alteration attributes is recorded on the different parts of the vessel, as each attribute related to specific behaviors associated with vessel use. Pedestalled temper was identified by the presence of eroding or raised temper from the ceramic wall. It is caused by an abrader (i.e., stick, spoon, spatula, etc.) that has a diameter less than the distance between the temper (Skibo 1992). Identification of other abrasion attributes including scratches, pits, polishing (consisting of fine linear scratches), thermal spalling, etc. and was identified on each vessel through a 10x hand lens or by the naked eye. Thermal spalling appears on the vessel wall in the form of small roughly circular divots ranging from 1 to 3 millimeters in diameter

(Skibo 1992:134). Thermal spalling is the result of water evaporating from a vessel placed in the fire for a long duration. I also recorded the patterns of the glossy and dull carbon deposits and oxidized patches. Skibo (1992:157-173) conducted experimental research to determine the distance a vessel is placed from the fire, as well as assessing how hard and soft woods affect exterior carbon patterns and how moisture affects permanent exterior carbon deposition. The experiments demonstrated that cooking with water produces a glossy soot on the exterior of the vessel. In addition, Skibo (1992:157-173) showed that all types of wood used to fuel the fire created similar carbon patterns. Third, his experiments suggest that cooking without water produce an oxidized patch on the base of the vessel.

The ceramic use-alteration patterns were cross-referenced with observations of use and with informant's knowledge of cooking, storage, and other activities. I interviewed informants concerning how they manipulate their vessels (i.e., cooking, washing) and then recorded how different behaviors cause the distinct use-alteration traces. A vessel's life-cycle usually involves a number of functions that have not been systematically documented in previous use-alteration research. Single function vessels will have specific signatures such as abrasions, thermal spalling, oxidation, etc., whereas multiple function vessels will have many signatures, but one may be predominant, allowing for identification.

Gamo Potter Interviews

During the period when I collected data on the vessels from each of the 60 households, I also spent time with the potters, interviewing them on the social and

technological issues concerning ceramic production and distribution. I conducted research on Gamo potters to understand the variation concerning pottery manufacture occurring in different Gamo regions. I wanted to understand the technological and nontechnological factors that influence pottery procurement, production, and distribution. Furthermore, research focusing on Gamo potters allowed me to understand how the manufacturing and distribution of pots influences their use, reuse, and discard patterns. The interviews with the potters were open-ended and so each interview was structured differently. However, questions usually included: what village did the potter come from (Gamo society is virilocal); what type of clays and fuels do you use to produce and fire the vessels; what are the names of each clay and how far (i.e., the time it takes to walk round trip to the clay source and back) is each clay source; what does each clay do in terms of its usefulness; what type of tools do you use; is it difficult to obtain fuelwood; do you produce the vessels individually or with other people; and at which markets do you sell your vessels.

In addition to documenting the production process, I investigated the potters' perceptions concerning the nontechnological and technological factors that influence the production process. In Zuza, a village with seven potters, interviews were conducted with six potters. In Guyla, all nine potters were interviewed. Interviews with potters included questions concerning: 1) the clay sources and their use, owner, cost, and location; and 2) the preferred clay sources, and reasons why the potters prefer a given source (Aronson et al. 1994). Additional information was collected on the entire production process including fuelwoods used to fire the vessel and questions relating to potters' social ranking in Gamo society.

To understand the ecological areas that potters collect their fuelwood from, I conducted a survey to find as many species of trees and grasses that were used for fuelwood by the Gamo potters. Several days were spent with a number of local people looking for specific trees and then a small branch was collected for genus and species identification. I could not find some of the fuelwoods. Adane Dinku from the Ministry of Agriculture, Department of Soil and Water Conservation, Chencha and Dr. Sebsebe Demissew from the Addis Ababa University Herbarium identified the taxonomy of each sample. However, some species have yet to be identified by researchers.

For future analysis, I collected from Gamo potters 27 samples of unfired clay and temper samples in order to conduct laboratory analyses. These samples will aid in our understanding of the technology of distinct potters in the Gamo region and on the relationship between consumer opinions of pottery quality and how archaeologists measure pottery quality by laboratory analysis. The analyses on the clay and temper samples will provide both emic and etic information that will aid archaeologists in understanding pottery distribution. The clay samples were brought back to the United States after I had received permission from the Ministry of Culture and Information and the Ministry of Mines.

Interpreting Social Status and Economic Wealth in the Household

One of the most important and more difficult analyses in household archaeology involves interpreting the socioeconomic position of each household. The analysis of socioeconomic levels within households is promising because many of the production and consumption activities take place within the household area and

households differ based on the specific cultural circumstances (caste, class, or occupation, to name only a few). In addition to indicating the specific socioeconomic position, the analysis at the household level allows for a larger view of the social, political, and economic conditions and changes that occur within agrarian societies (Smith 1987:298).

Mortuary remains and architectural studies are the most common types of analyses concerning the interpretation of wealth at the household level (Bartel 1983; Chapman et al. 1981; Lewis 1951:178; Mack 1951; McGuire 1983; Wilk 1983; Yang 1945:37-41). However, there has been little systematic work concerning how other types of material culture can contribute to understanding household wealth in an archaeological context (Smith 1987:298). Ethnoarchaeological research has provided a foundation to build an understanding of household wealth and material culture correlates (Deal 1998; Hayden and Cannon 1984; Kramer 1979, 1982). Smith (1987:298) believes that household artifacts can contribute to an understanding of household wealth in the archaeological record as long as suitable methods are utilized. Household ceramics are closely linked with the status of the household, because ceramics directly reflect the daily food preparations of all members of the household. Therefore, this ethnoarchaeological study of the Gamo, who have a strict social hierarchy, provides a valuable model for interpreting household social status in the archaeological record.

Household wealth is more difficult to interpret than social status, since wealth is constantly changing based on the household's developmental cycle. Status in a caste system is ascribed and usually does not change unless society allows a caste to acquire

additional status. Ceramic vessels are an excellent material for identifying household wealth, because household ceramics directly reflect a society's economic structure in terms of frequency, cost, and use-alteration attributes (McBride and McBride 1987; Miller and Stone 1970:98; Otto 1977, 1980; Smith 1987). Since household wealth can change through time, it is critical to analyze the different life-cycle stages of the ceramic assemblage. Furthermore, variation in household wealth may be measured using different types of analyses such as the spatial storage of vessels, vessel volume and frequency, and the longevity of vessels (Nelson 1981; Rice 1987:300; Shott 1996; Smith 1987).

Ceramic vessels are an important medium for interpreting household wealth because of their close association with subsistence and their durability against post-depositional factors. The different life-cycle stages of production, distribution, use, reuse, and discard of Gamo household ceramics may reflect different household patterns based on economic wealth. The Gamo's variability of household wealth provides an excellent means for looking at Gamo variability in household wealth.

Measuring social status in Gamo society

The Gamo have a strict social hierarchy consisting of a caste system. The caste hierarchy is, in order of ranking; (1) *mala*; (2) *mana*; and (3) *degala*. The Gamo caste system is an ascribed system and no action may change the status of an individual. Differences occur in the marriage rules among the Gamo. In the northern and central Gamo regions, caste members can only intermarry with members belonging to their same caste. The artisans belong to two caste groups, *mana* (potters) and *degala* (hide-workers, smiths, and groundstone makers), and they cannot marry one another.

However, in the southern Gamo region, all artisans belong to the same caste group, *mana*, and intermarry. They are considered equal in social status. Throughout the Gamo region, an individual may not marry another person belonging to the same clan.

The *mala* caste obtains a majority of their economic needs from farming, weaving, and trading. The *mana* caste acquires its economic means around the production of ceramic vessels. Although not all *mana* individuals have knowledge concerning how to produce ceramic vessels, individuals that belong to the *mana* caste always live in potter compounds. In addition, *mana* caste members may also farm or weave so that occupation is not synonymous with a specific caste. Members of the *degala* caste engage in hide-working, iron-working, or the production of grinding stones. Before the Derg regime came into political power in 1974, the *mana* and *degala* castes were not able to farm because of the control of land by the *mala* caste. However, after the Derg toppled Haile Selassie's government, the Derg government gave farmland to both the *mana* and *degala* households. Presently, some *mana* and *degala* still do not have land to farm and with the new government, some *degala* have reported that farmland has been taken away, as the Gamo are reinstating traditional social customs that were forbidden during the Derg regime.

Measuring economic wealth in Gamo society

The Gamo people base economic wealth on a number of conditions that are both associated and not associated with the caste system. Because the agrarian economy is fundamental to Gamo society, land is one of the most important wealth items. Thus, the *mana* and *degala* households that do not have land to farm are economically disadvantaged because they must rely on the selling of products that

they produce to provide income. If the household has more than one type of occupation, then the amount of economic wealth increases as more types of occupations gives the household economic diversity during the growing season. The type and number of houses are an indicator of wealth, as the construction of a traditional Gamo house is a considerable economic burden. In addition, building a nontraditional house constructed with wood, mud, straw, and corrugated tin sheets is an economic indicator of a wealthy household among the Gamo peoples. Another important indicator of economic wealth is the type and frequency of livestock that a household may own. Livestock is an important indicator of wealth for a household because livestock can provide a more varied diet such as eggs, butter, and milk that are expensive food items. Livestock makes the farmland more productive by providing manure for fertilizer and draft power for plowing. A household that consists of a husband and wife or wives, because the Gamo practice polygyny, provides the household with more economic opportunities.

In order to measure the emic perception of Gamo economic wealth; I developed a point system where I gave for each occupation within a household. If the household owned only one house then they received no points. If a household owned two houses then they received one point and so forth for each additional house. If the household did not own farmland or livestock then they received no points for either category, but if the household owned farmland or livestock (excluding chickens) they received one point for each category. If a widow or widower occupied the household, they received no points for the marriage category. Households with one wife received one point and if they had more than one wife, they received two points. I tabulated and

averaged all five categories for each household from the three villages. Based on the ranges and the mean rank score from the three villages I determined three ranks. The poorest rank ranges from one to three points, the second rank ranges from four to six points, and the wealthiest rank ranges from seven to ten points.

Caste and economic rank do not always coincide, so that the lowest caste group does not always belong to the lowest economic rank. Surprisingly, there are *degala* households that are members of the wealthiest economic group, as well as some *mana* and *degala* households situated within the second economic group. This indicates that there is no one to one relationship between social status and economic wealth (Table 2-1 and Figure 2-1).

Table 2-1: Mean values of wealth attributes among each of the three Gamo castes.

Caste	Mean # of Houses	Mean # of Farmlands	Mean # of Livestock	Mean # of Wives	Mean # of Occupations
mala (n = 48)	2.3	3.4	2.7	0.9	1.5
mana (n = 6)	1.5	1.5	0.7	1.2	1.5
degala (n = 6)	1.7	1.5	0.3	0.8	1.8

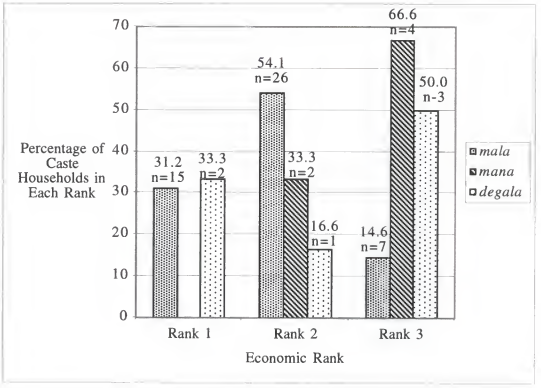

Figure 2-1: Relative frequencies of caste households found in each of the three economic ranks.

Conclusion

The life-history approach to pottery among the Gamo of southwestern Ethiopia allows for a detailed contextual analysis between people's behavior and their pots. A vessel's life-history from procurement to discard also provides an analysis of the effects of regional, social, and economic conditions on pottery variation. Because Gamo pottery vessels are associated with the different regional, social, and economic contexts of Gamo life, they provide a means to understanding how to interpret cultural variation at historic and prehistoric sites. Therefore, the focus here is to aid in interpreting intervillage, social, and economic variation by looking at many different

contexts concerning the pot's life-history and the Gamo's complex regional, social, and economic framework.

CHAPTER 4
THE INTEGRATION OF CERAMIC PROCUREMENT, PRODUCTION, AND DISTRIBUTION

Ceramic procurement and production studies have not been systematically integrated with distribution research to explain effectively the complexities of how ceramics are made and dispersed over the landscape (Bey and Pool 1992). The types of Gamo pots manufactured during the year are affected by consumers' demand. In addition, the materials (i.e., clays, tempers, and fuelwood) that potters have access to influence the types of pots they usually produce. The markets at which potters and consumers sell and purchase their pots determine where vessels are used and eventually deposited. The social makeup of a village strongly determines how pots are distributed, as a non-pottery-producing village may have a wider array of pots produced throughout the Gamo region than a village with resident potters. Gamo society provides an excellent opportunity to study how ceramic production and distribution are interrelated. The majority of my research centered on interviews in the villages of Zuza, Guyla, and Etello. Regional information is also incorporated into the discussion concerning the relationships between the procurement, production, and distribution.

Gamo Ceramic Procurement and Production

Gamo potters share similar ceramic technology, but differences do occur among potters in their manipulation of the production and distribution processes. The Gamo potters are fulltime specialists, who either do not own land or own a limited amount of farmland. They produce fewer ceramics during the second rainy season, as it is often difficult to obtain the clays due to flooding and the unfired vessels dry too slowly. In addition, the rainy season can also postpone or even put out firings half way through the firing process. Potters store their materials, produce vessels, dry, prefire, and fire their vessels within their family compound. Wealthier potters have small workshops adjacent to their house, where they conduct their work. The poorest potters will work either in their compound or in the house vestibule.

The Learning Process

Women make pottery in Gamo society. Only one man was observed forming small toy jars to sell to children because his wife had died and he did not have any family or farmland. Women work on all aspects of the production and marketing of their wares including: digging the clay; carrying the clay and wood; forming and firing the vessels; and carrying the pots to the market. Depending on the household, men do help with some production tasks such as digging and cleaning the clay, collecting the wood, firing the pots, and carrying the vessels to the market.

The potter's placement in Gamo social hierarchy is ascribed and determined by birth, and no action may change the hierarchical positioning of individual potters or other craft specialists. Potters believe that they must teach their daughters how to

produce pottery, because the limited amount of farmland prevents the *mana* caste from owning enough farmland to meet household subsistence needs. Because the postmarital residence in Gamo society is virilocal, *mana* women move to their husband's household, where they may encounter a range of economic conditions. Women potters may find themselves in a family that has farmland or they may find that their new family owns only the land in which the house is situated. Even if the husband has farmland, it usually does not produce enough food for the family. Therefore, learning how to produce pottery provides the *mana* women with a skill and the household with an important economic livelihood.

Gamo potters learn how to produce pottery usually from their mothers, when they are six to thirteen years old. Some potters do learn from their mothers-in-law, after they have been married and move to their husband's household. Apprenticeships usually last for three years or until the daughter is married. Girls begin learning the production process by helping their mothers mine and carry the clay from the clay sources to the household compound. They also will transport water from the well or stream using a water jar (*hadza otto*) to mix the clays. In addition, they help in cleaning the clay of stones, grinding the clay, and selecting grog temper from broken vessels, which cracked either during the drying or firing process. As they become more experienced with all of the production activities, they will practice producing small vessels.

The majority of Gamo potters, with the help of their daughters (in-law), produce pots by themselves. Sometimes two wives of the same husband will work together, as one family does in Guyla. Some potters who are friends will travel to the

clay sources together to procure the clays. In addition, sometimes a mother or daughter will travel to each other's village and stay for a week or so and help the host potter manufacture pots. There are competitive feelings between different potter families, even if they are friends, and so the majority of potters work alone with their own family members.

The potters state that they produce their vessels similar to the person who taught them (e.g., mother or mother-in-law). However, the new locality, family, friends, and different consumers often influence changes in pottery production. Although the majority of the learning process is conducted at the mother's household, once the potter moves to her husband's household she learns how to produce and distribute her vessels from both her husband's relatives and other village potters. The new potter has to learn where the clay and temper sources are located. She has to learn what proportion of the different clays work well together, as some clays do not work well in the shaping of specific vessel forms. She needs to know if the drying process is the same as in her childhood village, as the temperature and precipitation patterns may be different if her new village is in a different ecological zone. In addition, she has to learn what types of fuelwood are accessible and how her new village potters prefire their vessels. She then needs to learn which weekly markets are best to sell her wares and if the prices for different forms are different from her former childhood village. Thus, there are two subsystems in the learning process among Gamo potters, her childhood village and her husband's village.

The learning process not only influences the potter's production methods but also has direct implications towards how the potter forms and decorates the vessel, and

this affects the vessel's style. The majority of potters believe their rim shape is the most important attribute in discriminating their vessels from their teacher's vessels. Other attributes that potters felt were different from their mothers is the type of formal decoration (e.g., appliqué, impressed designs, and incising) and the shape of the vessel. Although no sorting test was conducted to test if daughters could differentiate their own vessels from their mothers, future research will include testing mothers and daughters living in the same compound and village and mothers and daughters living apart from each other.

Clay and Temper Acquisition

Each village has its own set of clay sources, which is either mined individually or with other potters in the village. One reason that potters mine at particular sources is the relationship between the clay source's landowner and the potter. Archaeologists are able to measure the physical attributes of clays such as elasticity, hardness, particle size, etc., but we are usually unable to measure the social conditions that influence a potter's choice in clay procurement (Aronson et al. 1994). Thus, understanding both the social and physical conditions in the mining of clay can aid us in understanding the potter's decision-making process.

Proximity to the clay source is an important factor for Gamo potters, since potters carry the clay in baskets (*tise*) on their backs. Guyla potters mine their clay from sources that are less than six kilometers from their village. Guyla potters collect three of the five clays and one temper (nonplastic material) between one to six kilometers and the remaining two sources are within one kilometer of their village.

Guyla potters who collect the *ano* temper and *poze* and *ooka* clays walk 6 hours (round trip) to transport all three materials. However, one potter family in Guyla obtains their *zoo* clay directly from their household property and the *caretsa* clay is located adjacent to the eldest potter's household land.

All three clays used by the Zuza potters are between one and six kilometers of their village. The time it takes for Zuza potters to transport their clays both ways is five hours each for the *walle* and *kura* clays, and three hours both ways for the *mochollo* clay. Potters living in the villages of Denkarar and Keya (less than one kilometer from Zuza) use different clay sources than Zuza, indicating that each village within a region decided independently where the potters should mine their clay. When potter women marry and move to Denkarar, Keya, or Zuza villages, they are taught by the older potters in their new village where to extract clay. Zuza potters stated that they pay a tax to the Ethiopian government for the use of the clay.

Other factors that influence where potters may obtain clay and temper are their relations with the landowners of the clay sources and elders' decisions on where potters may mine clay. The majority of Guyla potters belong to two families. One potter family extracts all of its clays from its own land. The other potter family collects only one clay from its land and the *poze* clay is collected from a farmer's land. However, both families do mine from the same temper source (*ano*) located outside of Guyla approximately four kilometers to the northwest. The two families do not share their clay sources with each other to protect their clay source(s) from becoming depleted. Two landowners who are farmers will not allow the Guyla potters to mine their clay. Several of the Guyla potters complained that they are not treated well by the

farmers because of the potter's low status within Gamo culture. One Guyla family that uses a clay source named *pullticalo* (after the landowner's name) has had problems with the water table flooding the hole. This is especially a problem during the rainy seasons, which limits the frequency of production among this family of Guyla potters. The *pullticalo* clay is extracted approximately 4 to 5 meters from the surface with the majority of the clay lying just above and below the water table. An adjacent source was abandoned after a potter was killed in 1996 when the wall of the clay pit collapsed. This potter family is uncertain about their future because the *pullticalo* clay source is becoming too dangerous and it is difficult to find a landowner within the proximity of Guyla willing to let the potters mine clay.

Efforts by the national government to have people move from the highlands to the lowlands adjacent to Lake Abaya took place during the Derg government between 1974 and 1991. The Derg government established lowland villages and more than ten potter families have moved from the highland region to the village of Fura Mandita. The incentive for potter and other families to move to the lowlands is to obtain farmland. The Derg government's socialist ideology advocated that all people have access to farmland. Although the potter families have farmland in the lowlands, there are no clay sources in the lowland region, causing potters to travel back to the highland sources for clays. Potters from Fura Mandita walk six hours round trip (approximately 14 kilometers round trip) up to the Donay region to obtain their clays. The husband of the family I interviewed collects the three clays. Among the Gamo potters, relations with landowners, geological constraints, and proximity are the primary reasons given by the potters for deciding where to mine their clay.

Technical Factors in Clay and Temper Selection

Whereas social conditions tend to influence where potters extract their clay, once the clay has been mined technical factors predominate concerning how the potters manipulate their clays and tempers (Table 4-1). The Gamo potters are concerned more with how the clays and temper perform when being processed during production than with how the clays react when used by consumers. The potters have specific reasons for using their selection of different clays and temper (Arthur 1997).

Table 4-1: The functional attributes ascribed to clays and temper by Zuza and Guyla potters.

Types of Clay and Temper	Zuza
Kura (clay)	Provides elasticity to the vessels and is the most important clay.
Mochollo (clay)	When *Mochollo* is mixed with the Kura clay, the two protect the vessels during the firing process. *Mochollo* is the second most important clay.
Walle (clay)	Provides color to the vessel and is the third most important clay.
	Guyla
Ano (temper)	Provides elasticity and strength. Provides strength during firing.
Zoo (clay)	If only use *Zoo* the vessel will not have strength. Provides form to the vessel especially during the dry season.
Caretsa (clay)	The best clay because of its elasticity and keeps the vessel from falling when wet.
Pose (clay)	Stone like quality. Stops cracking during drying period.
Ooka (clay)	Will break easily without mixing *Ano* and *Pose* clays. Provides elasticity. Stops cracking during drying period.

The majority of statements by potters concerning the correct combination and proportion of the clays when mixed indicate the importance of using all of the clays and tempers to achieve the proper result. In Guyla, potters state that if they just use the *zoo* clay the vessel will not be strong, and they have to mix the *ooka* clay with temper

and *pose* clay or the pot will break. In Zuza, the *mochollo* and *kura* clays have to be mixed so that the pots will not break during the firing process. In addition, collecting clays that provide elasticity when forming the vessel, curtailing cracks during the drying period, and protection against the firing process are all important during production.

Every Guyla potter uses the *ano* temper indicating that the temper provides an important technological component to the production of the pottery. This is supported based on the fact that the *ano* temper source is located farther than any other material, and all the Guyla potters use it for the manufacturing of pottery. The *ano* temper is an important resource in protecting the vessels during firing. One Guyla potter stated that before placing the pots in the fire she covers them with the pumice *ano* temper which keeps them from breaking during firing. The *walle* clay is the only material that has a nontechnological role by providing color to Zuza pots. The potters' clay and temper descriptions provide an emic perspective concerning what clay and temper attributes are necessary for production.

Forming the Vessels

The number of pots manufactured by potters varies with each potter, with a range of 5 to 70 vessels per week. Gamo potters usually specialize in the production of one or two vessel types even though they can usually produce all types. Sometimes the clays used in a village are not suitable for the production of certain vessel types. For example, Guyla potters do not usually produce baking plates (*bache*) because they state that the clay is not adequate for this type of production. The Gamo potters

produce specific types of vessels to process various crops. For example, they produce: two types of cooking jars (*otto* and *tsaro*); a cooking pot (*diste*); a beer storage jar (*batsa*); a coffee pitcher (*jebana*); a drinking jar (*tsua*) and a baking plate (*bache*). They also make water transport and storage jars (*hadza otto*), two types of serving bowls (*shele* and *peele*), and water pipes (*guya*) for smoking tabacco. Protestant potters will not produce water pipes, because it is not allowed by their religion. The less commonly produced types include a bowl for washing feet (*gumgay*), a drinking jar (*kolay*), and a small cooking jar (*tayche*). In the past, they produced a coffee cup (*sene*), which has been generally replaced by imported Chinese porcelain cups. Only one traditional *sene* was found during my vessel inventory of sixty households in three villages. Figures 4-1, 4-2, and 4-3 indicate the types of vessel forms manufactured by Gamo potters.

Gamo potters mix three to four types of clay together to produce all of the vessel forms. Naturally mined temper (nonplastic inclusions) and/or grog (small pieces of broken ceramic) are also added to the clays. Guyla and Zuza potters use ground fragments of fired clay or grog, but Zuza potters do not use additional temper because enough temper occurs naturally in the Zuza clays. The potters remove the pebbles and other impurities from the clay to prevent production problems. After the clays are cleaned, the clays are pounded with a large stick (*bookadoka*) and sifted through a woven basket (*zizarey*). The *zizarey* or woven basket also serves to aid in measuring the proportion of each clay in the final clay mixture. All vessels are made with the same proportion of clays. Once the clays, tempers, and water have been mixed together in their proper proportions, the potters can begin to form the vessels.

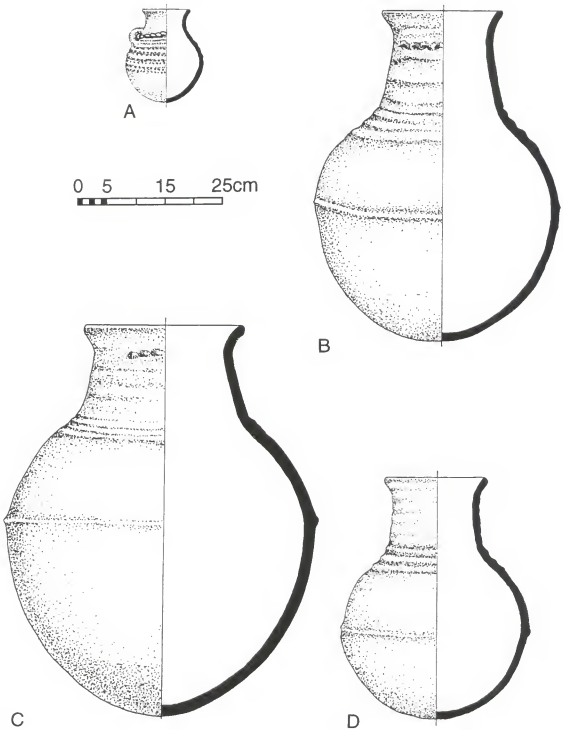

Figure 4-1: Profile drawings of (A) *tsua*, (B) *otto*, (C) *batsa*, and (D) *tsaro*, which the Gamo potters produce.

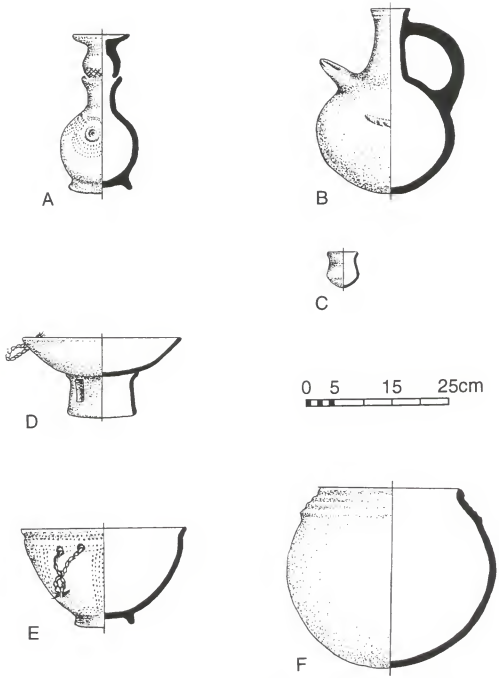

Figure 4-2: Profile drawings of (A) *guya*, (B) *jebana*, (C) *sene*, (D) *peele*, (E, F) *shele*, which the Gamo potters produce.

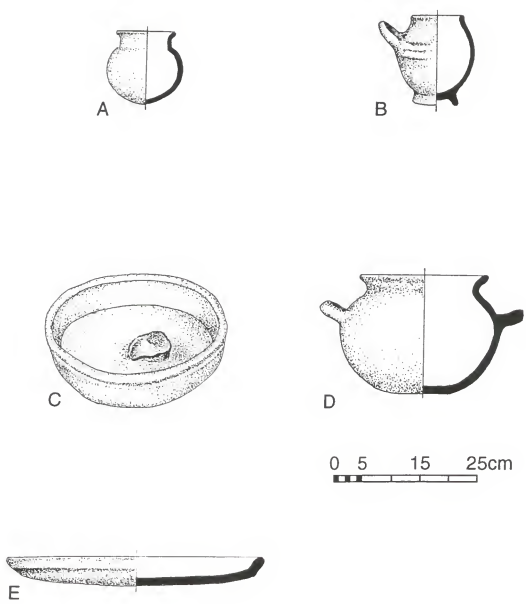

Figure 4-3: Profile drawings of (A) *tayche*, (B) *kolay*, (C) *gumgay*, (D) *diste*, and (E) *bache*, which the Gamo potters produce.

Vessels are formed using a combination of hand building, coil-and-scrape, and paddle-and-anvil techniques. The type of vessel construction is dependent upon the vessel form. While the vessels are still wet, a piece of leather (*gelba*) or cloth is used to help form the clay rim and neck. The exterior of the vessel is thinned using a bamboo stick (*mylee*). The interior of the vessel is thinned and smoothed with the outer covering of half a seedpod (*kayshe* tree) (I was not able to obtain the taxonomic name) that is obtained from the lowland area adjacent to Lake Abaya.

The jars (e.g., *tsua, tsaro, otto,* and *batsa*) are formed by drawing the clay up to produce the upper part of the body and then the neck and rim are formed using the coil-and-scrape method. Once the top half of the vessel is formed, it is turned upside down on its rim and placed on a piece of enset leaf to keep the vessel from touching the ground. Then the rounded base is formed using the coil-and-scrape method until the base is eventually closed up. *Distes* (cooking pot) are formed as the jars are, except that the base of the *diste* is flat instead of round. The production process is more elaborate on the large storage jars (*batsa*). After the upper half is formed, the vessel's exterior is scraped to thin the walls. Then the potter uses two hand stones, one in the interior and one on the exterior, to pound and compact the walls of the *batsa*.

Small-to medium-sized bowls (*shele*) and serving dishes (*peele*) are formed by pounding a fist into a lump of clay. Then the potter moves around the bowl and dish shaping it until it is formed into a *shele* or *peele*. Although large bowls (*shele*) are produced similar to the jars by forming the upper half first and then the base, some *shele* and *peele* vessels have base stands attached to the body which are formed after the body is shaped into its final form.

The baking plate (*bache*) is formed from a lump of clay that is pounded with the fist until it begins to take the shape of a *bache*. Then the potter moves around the vessel slowly working on the shape of the rim with a wet piece of leather or cloth. After the *bache* dries in its first stage (i.e., 15 days), the exterior of the *bache* is scraped with a bamboo stick and then laid upon a grinding stone and pounded with a hand stone to compact the vessel wall. The interior of the *bache* (baking plate) is burnished whereas the exterior is left rough and plain in appearance.

The coffee pitcher (*jebana*) is produced by forming the base and body similar to the small-to medium-sized bowls. Then the neck is produced using the coil-and-scrape method. The spout is formed by attaching a small coil on the upper part of the body. A small stick is used to hollow out the spout, which is then shaped into its final form.

Drying the Vessels

The vessels are dried from three days to two months depending on the potter's preference, which is based on the type of clays, type of vessel, and season (Table 4-2 and 4-3). The majority of vessels are first dried on the ground and then placed on an elevated rafter situated over a hearth, where they will sit until they are ready for firing. During the two rainy seasons (i.e., March to April and June to September), vessels are dried for a longer period of time, which reduces the number of vessels produced. Although some potters use the same types of clays, there is variation in the amount of time to dry specific vessel types. Zuza potters will hang their baking plates (*baches*) with enset rope from the interior wall of their house until they are leather hard. It is not

Table 4-2: The drying location and time for specific vessel types produced in Zuza.

Vessel Type	Interior House Drying Location	Length of Drying Time
Bache (baking plate)	Hang on House Wall	15 Days
Bache (baking plate)	Rafter	1 Week
Diste (cooking pot)	Rafter	11 Days
Shele (serving bowl)	Rafter	11 Days
Otto (cooking, transporting, storage jar)	Rafter	11 Days
Batsa (storage jar)	Rafter	28 Days

Table 4-3: The drying location and time for specific vessel types produced in Guyla.

Vessel Type	Interior House Drying Locations	Range of Drying Time
Jebana (coffee pitcher)	Ground	7 to 14 Days
	Rafter	7 Days
Diste (cooking pot)	Rafter	7 (dry season) to 14 Days (rainy season)
Otto (cooking, transporting, storage jar)	Ground	14 Days
	Rafter	7 Days to 1 Month
Tsaro (cooking jar)	Ground	10 Days (dry season)
	Rafter	7 (dry season) to 14 Days (rainy season)
Shele (serving bowl)	Rafter	7 Days to 1 Month (depends on vessel size)
Bache (baking plate)	Ground	7 Days
	Rafter	3 to 7 Days
Tsua (serving jar)	Ground	3 to 7 Days
	Rafter	4 to 7 Days
Upper part of *Batsa* (storage jar)	Ground	4-5 Days
Complete *Batsa* (storage jar)	Ground then Rafter	2 to 3 Weeks (ground) to 1 to 2 weeks (rafter)
Complete *Batsa* (storage jar)	Rafter	1 Month
Guya (water pipe)	Rafter	1 Month
Peele (serving dish)	Rafter	7-14 Days
Gumgay (washing bowl)	Rafter	2-3 Weeks to 1 Month (depending on weather conditions)
Mestakalay (pot supports)	Rafter	7 (dry season) to 14 Days (rainy season)

uncommon to see more than a dozen baking plates hanging from the house walls within each of the Zuza potter's houses.

Decorating the Vessels

After the vessel is dried, the potters then burnish the vessel with a quartzite polishing stone (*elasucha*) either on both the interior and exterior walls or only on one side of the wall. The location of the burnishing relies on the vessel type (Tables 4-4 and 4-5). Potters stated that burnishing gives the pots "a bright color." The Guyla potters decorate the vessels with a combination of appliqué, incising, and rippling, whereas the Zuza potters decorate their pots only with appliqué.

The type and placement of decoration is dependent upon the vessel form and most importantly, the individual potter. Appliqué rings (*sheto*) that encompass a vessel are common on the cooking and storage jars. Usually one *sheto* is placed on the maximum circumference of the large cooking and storage jars, but the largest storage jars may have two or three *shetos* placed on their maximum circumference. Three *shetos* are placed also on the upper body of the large jars. A *sheto* is also found on the base of serving bowls, which serve as footrings, but sometimes *shetos* can begin at the maximum circumference of the serving bowl and continue either to the base or to the rim.

Another appliqué type of decoration is *temo* which are small (numbering 3 to 9) found on the upper exterior wall of the cooking and storage jars. Sometimes potters put a series of *temos* on the upper body of distes (cooking pots), which otherwise are undecorated.

Incising (*beesho*) vessels is usually practiced in the central Gamo region, such as Guyla, but is rarely made by Zuza potters. The incised designs are made with either sheep teeth attached to a stick or two iron prongs attached to a wood handle (both tools are named *chechamarcho*). The *beesho* can be applied on the interior and/or exterior of the serving bowl and dish (i.e., *shele* and *peele*), the exterior of the drinking jars (*tsua*) and on the exterior of the water pipes (*guya*). The individual potter and the larger village/regional stylistic traditions dictate this type of decoration. In addition, potters often discussed how incising is a time consuming activity. Therefore, potters incise a vessel more if it is being sold to a specific individual, than if it is sold at a weekly market. Serving vessels produced in the central Gamo region can have a combination of all types of decorative styles, based on the individual potter, the village and the regional style.

The third type of decoration is rippling (*kansa*), which is when the potter forms grooves on the exterior wall. Rippling is found on the necks of jars and serving vessels. The rim on all jars and the majority of bowls also is referred to as *kansa*.

Table 4-4: Zuza potters placement of burnishing on vessel forms.

Vessel Form	Interior	Exterior	Both Interior and Exterior
Diste (cooking pot)	-	-	Yes
Shele (serving bowl)	-	-	Yes
Peele (serving dish)	-	-	Yes
Jebana (coffee pitcher)	No	Yes	-
Tsua (serving jar)	No	Yes	-
Guya (water pipe)	No	Yes	-
Bache (baking plate)	Yes	No	-
Otto (cooking, transporting, storage jar)	Yes	No	-
Batsa (storage jar)	No	No	-

Table 4-5: Guyla potters placement of burnishing on vessel forms.

Vessel Form	Interior	Exterior	Both Interior and Exterior
Diste (cooking pot)	-	-	Yes
Tsaro (cooking jar)	-	-	Yes
Shele (serving bowl)	-	-	Yes
Peele (serving dish)	-	-	Yes
Jebana (coffee pitcher)	No	Yes	-
Tsua (serving jar)	Yes (interior neck)	Yes	-
Guya (water pipe)	No	Yes	-
Bache (baking plate)	Yes	No	-
Otto (cooking, transporting, storage jar)	-	-	No
Batsa (storage jar)	No	No	-

Gamo potters name pots with human anatomical features. Potters name the top of the rim the mouth (*dona*), the neck is also called the neck (*core*), the body is called the stomach (*oolo*), and the base is called the anus (*tache* in Zuza or *meskatay* in Guyla). A rare type of appliqué is a large oval, which points upward and is placed on the upper body of cooking jars. This decoration is called *dansa*, which translates as breast. *Guyas* (water pipe) usually have a specific decoration that is only placed on this vessel form that is called *pigay*. *Pigay* translates as a scar and is associated with scars created by burning the skin believed to heal wounds and pains. In addition, the hole, where the hollow bamboo stem (*pikay*) is used to suck the smoke from the *guya* (water pipe), is called the drinking place (*owezaso*). Besides giving potters a classification for specific parts of a pot, the naming of anatomical features by Gamo potters suggests a symbolic importance to potters. Since the majority of potter families rely on the manufacturing of pottery vessels for their sole livelihood, potters take the clay and temper, and bring what the *mala* consider dirty work, to life in the form of a

pot. The ceramic vessel can be used to bring sustenance to the potter family by selling or exchanging for food and processing food into an edible form.

Selection of Fuelwood

Gamo potters use of fuelwoods is determined by their village's ecological location (Table 4-6). For example, since Zuza potters live within the *baso* ecological zone and are socially tied to other lowland communities, they collect their fuel from the lowlands. The area surrounding Zuza is dense with grass and trees and it is much easier to obtain fuel for the Zuza potters, than it is for Guyla potters who live in the highland or *dega* ecological zone. Fuelwood shortages commonly were mentioned by Guyla potters as causing production problems. Guyla potters will use cow dung (*osha*) and/or horse dung (*fando*) if they are not able to find enough wood or grass. Since the Guyla village is located in the *dega* ecological zone, which is more densely populated and farmed than the Zuza hinterland, the Guyla potters gather some of their fuels from the *baso* ecological zone (e.g., *gargecho* and *odora* trees). Potters from both villages have favorite types of fuels that are based primarily on technological rather than nontechnological factors.

Zuza potters pay five birr (US $0.75) per bundle for all of their types of fuels. They use ten types of fuels collected individually from the lowlands adjacent to Lake Abaya but prefer seven fuel types. The fuel types they prefer are *shankara*, *shobo*, *checha*, *omazey*, *galas*, and *goganza* trees and *gata* grass. They prefer the *goganza* and *galas* trees because the fire burns longer than other types of fuel.

Table 4-6: Taxonomic and Gamo names and corresponding elevational ranges of fuels used to fire ceramic vessels by village demonstrating primary dependence on local resources.

Village	Taxonomic Name	Gamo Name	Elevational Range
Zuza	Hyparrhencei sp.	*Gata* (grass)	1100-3000 m
(lowland)	Acacia nilotica (subalata)	*Checha* (tree)	900-1000 m
	Terminahei sp.	*Galas* (tree)	250-2200 m
	Olea africana	*Wera* (tree)	(not published)
	Ficus sycomorus	*Lafo* (tree)	500-2000 m
	?	*Shankara* (tree)	
	?	*Omazey* (tree)	
	?	*Goganza* (tree)	
	?	*Bolala* (tree)	
Guyla	Erythrina abyssinica	*Borto* (tree)	1300-2400 m
(highland)	Erythrina brucei		1400-2600 m
	Myrica sahcifolei	*Shenato* (tree)	1750-3300 m
	Eucalyptus sp.	*Barzaf* (tree)	
	Arundinaria alpina	*Wesha* (tree) (Bamboo)	2200-4000 m
	Dombeya sp.	*Anka* (tree)	850-3100 m
	Maesa landeolata	*Gargecho* (tree)	700-1700 m
	Acacia brevispica	*Odora* (tree)	900-2000 m
	Hyparrhencie sp.	*Gata* (grass)	1100-3000 m
	Cupresse lustanica	*Tseda* (tree)	(not published)

Guyla potters communally buy fuelwood that costs between 14 and 40 birr (US$ 2 to 6) per tree depending on the type of fuel. They use between two and 11 fuel types that are all found within six kilometers of Guyla. The types of fuels are *fando* (horse dung); *osha* (cow dung); *kashelo* (bamboo leaves); *barzaf* (eucalyptus tree), *gedema*, *borto*, *anca*, *shenato*, *tseda*, and *gargecho* trees. The two rainy seasons affect the types of fuelwood used, because certain woods dry faster during the rainy seasons than others. The Guyla potters prefer *anka*, *barzaf*, *barto*, *shenato*, *gata*, or *kashelo* fuel. Two reasons were given as to why certain fuels were best. First, they believed that *anka*, *shenato*, *barto*, or *gargecho* woods are best because they burn longer than

other fuel types, especially during the dry season. Second, the eucalyptus or *barzaf* tree was considered the best during the rainy season because it dries fast. Potters from both villages stated that it was more important to have a fire that burns for a long time rather than a fire that is very hot.

Prefiring and Firing the Vessels

After burnishing and decorating the pots, potters prefire vessels on top of a wooden rack (*afansha*) located in the workshop or potter's house. The vessels are slowly smoked and heated for approximately four hours before being put in the open fire located outside in the compound. The construction of the open fire begins by placing either a layer of ash or eucalyptus leaves on the ground. This is done to provide a buffer between the ground and the vessels, as the ground may be moist, which will cause the vessels to crack. A layer of wood is carefully laid on the ash or leaf surface. Then the vessels are placed on top of the wood and finally dried grass is applied. During the firing of the vessels, more grass is placed onto the fire and the potter eventually pokes a stick at the base of the grass heap to make a hole so the potter can see how the vessels are firing. This also provides more oxygen to the fire, which will ignite the remaining portion of the grass. The open fire lasts approximately two hours. Potters usually fire between four and 30 vessels on a specific day every week. Generally the vessels are fired the day before they are taken to the market.

The majority of potters have strong opinions concerning who can be around when they are firing. They believe that a person who has "a bad leg" will cause the vessels to break during the firing. They believe that if someone with "a bad leg"

thinks, "the potter is firing too many pots," then the vessels will break. The belief is related to the person eating the vessel's spirit (i.e., *godomaty*), causing the vessels to break during the firing process.

Vessel Postfiring Treatment

Immediately after removal from the fire, a coating of *etema* (i.e., liquid from the enset plant) is applied to the exterior and/or interior of the vessel (Table 4-7 and 4-8). They believe *etema* gives the vessel strength and beauty. In Zuza, they put *etema* on the same vessel side that they burnish, which they state provides a reflection and is a type of decoration. In addition, cow dung is applied on the exterior of cooking jars from the base to the maximum diameter. The application of cow dung provides added protection against cracking while on the hearth.

Table 4-7: Zuza potters placement of *etema* on specific vessel forms.

Vessel Form	Interior	Exterior	Both Interior and Exterior
Jebana (coffee pitcher)	No	Yes	-
Guya (water pipe)	No	Yes	-
Tsua (serving jar)	No	Yes	-
Tsaro	No	Yes	-
Bache (baking plate)	Yes	No	-
Otto (cooking, transporting, storage jar)	Yes	-	-
Batsa (storage jar)	No	No	-
Diste (cooking pot)	-	-	Yes
Shele (serving bowl)	-	-	Yes
Peele (serving dish)	-	-	Yes

Table 4-8: Guyla potters placement of *etema* on specific vessel forms.

Vessel Form	Interior	Exterior	Both Interior and Exterior
Jebana (coffee pitcher)	-	-	Yes
Diste (cooking pot)	-	-	Yes
Tsua (serving jar)	-	-	Yes
Tsaro (cooking jar)	No	Yes	-
Otto (cooking, transporting, storage jar)	Yes	Above Maximum Diameter	-
Bache (baking plate)	Yes	No	-
Batsa (storage jar)	No	No	-
Shele (serving bowl)	-	-	Yes
Peele (serving dish)	-	-	Yes
Guya (water pipe)	-	-	Yes

Village Ceramic Distribution

After the vessels are produced, potters transport their vessels to a variety of weekly markets (Table 4-9). Vessels are tied together with enset rope and transported either by head carrying and/or horse or donkey. Men and/or women transport their vessels to the weekly markets. Women will usually stay home if they have small children, since some markets are over 10 kilometers one way from their house compound. The majority of the market transactions are conducted with the Ethiopian national currency, the birr. In the small village markets, vessels will be traded for a certain volume of a specific crop. In addition, neighbors of potters will usually trade the potter's vessels for crops, which is an important component in the patron-client relationship, since many potters do not have farmland. Thus, many potters are dependent upon their farmer clients. This has implications for the variety in the diet of potters, because potters and other artisans have a less varied diet than the farmer households (see Chapter 5).

Table 4-9: The location and the distance different Gamo potters transport their vessels.

Village / Region	Market	Distance (one way)
Guyla	Leesha	Less than 1 km
	Doko Mesho	6 km
	Chencha	12 km
	Ezo	9 km
	Zada	4 km
Zuza	Ochollo	Less than 1 km
	Chano	6 km
Birbir	Ezo	9 km
	Charey	Less than 1 km
	Mirab Abaya	13 km
Ezo	Ezo	Less than 1 km – 3 km
	Chencha	12 km
	Dorze	18 km
Borada	Ezo	12 – 18 km
Zada	Doko Mesho	6 km

The Market and Patron-Client Systems

The Gamo people purchase their pottery by different means. Pottery consumers in the villages of Zuza and Guyla either purchase their pots from markets or directly from the potters' households. The inhabitants of Etello must travel to markets to purchase vessels because there are no potters living in the village or within the larger associated region of Doko. Figure 4-4 shows the differences in the frequency of pots between Etello, a non-potter village, compared to Zuza and Guyla, which have potters living within each village. When comparing the 20 households from each of the three villages, Zuza and Guyla have a mean of 17.3 and 24.5 pots per household, respectively. In contrast, Etello has only a mean of 11.1 pots per household.

The markets in Gamo are organized according to the days of the week. Large markets that are located near one another do not have their markets on the same day.

Large markets in the central Gamo region include Bodo (Dorze), Tuka (Chencha), Pango (Doko Mesho), Zada, and Ezo. The only large markets that are on the same day (Table 4-10) are Ezo and Bodo, which are 18 kilometers apart. Consumers will decide to travel to either one of the markets based on the type of material they want to purchase, because some markets have cheaper prices for some goods or better products compared to other markets.

Table 4-10: Large markets in the central Gamo region and their corresponding days.

Market	Days
Bodo (Dorze)	Monday and Thursday
Tuka (Chencha)	Tuesday and Saturday
Pango (Doko Mesho)	Sunday
Ezo	Monday and Thursday
Zada	Tuesday

The patron-client system (*mayla*) transpires between potter and consumer in the villages of Guyla and Zuza. In the past before the integration of an Ethiopian currency, potters and farmers exchanged pots for food, but presently there is a mixture of exchange for food and purchasing with the birr. However, the system remains as an important means of social and economic integration between the two castes (i.e., *mala* and *mana*). Potters are in one respect responsible for supplying their village with pots, but also they are free to sell at weekly markets, providing non-potter villages access to vessels. The vessel inventory indicates that the households that purchase their vessels from Guyla potters buy or exchange mostly with a single Guyla potter (Figure 4-5). The majority of Zuza consumers also purchase their pots from the Zuza potters.

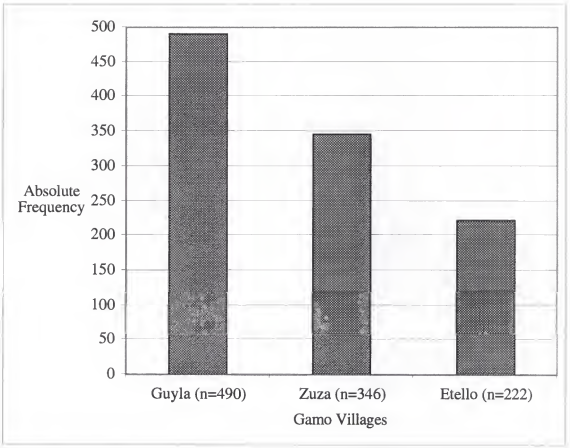

Figure 4-4: The absolute frequency of vessels inventoried among 20 households in each of the three Gamo villages demonstrating a greater number of vessels in the pottery-producing villages (Guyla and Zuza).

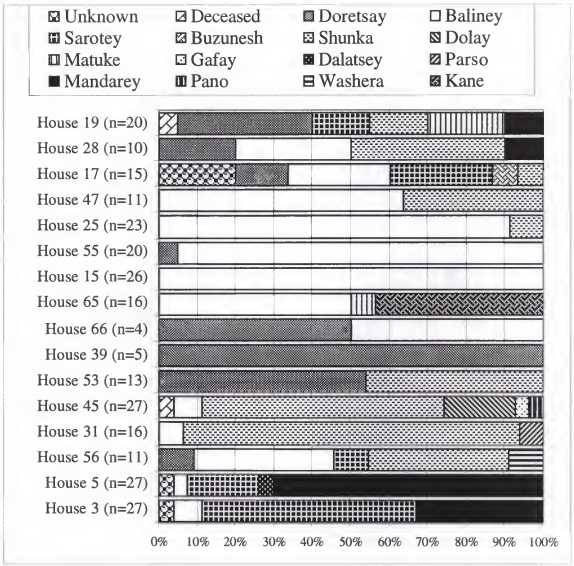

Figure 4-5: Graph illustrating that Guyla households generally purchase most of their ceramics from a single potter.

Consumer Pottery Preferences

The census information collected from the villages of Zuza, Guyla, and Etello indicates the frequency of consumer preferences for particular potters. Each household was visited in each village and the eldest woman for the household was asked two

questions relating to pottery: (1) which pottery region or village produces the best pottery?; and (2) why she preferred pottery from that region or village? Comparison between the villages reflects regional differences in consumer preference. This is because consumers tend to attend markets close to their own village.

Zuza village

Consumers in the village of Zuza either prefer the Zuza potters or a combination of Zuza and other Ochollo *dere* potters (Table 4-11). Ochollo has a market every Sunday with all Ochollo potters attending to sell their wares. The consumer preference for Ochollo potters is mixed between technological and nontechnological factors. Most people believe that the Ochollo pots are stronger (technological), meaning they last a long time or are more durable. Other important technological factors are the quality of the clay, the quality of the work, and/or the length of time the potters take in drying their pots. Proximity was the only nontechnological answer given by the Zuza consumers. Part of the Ochollo market area is located within Zuza village.

Guyla village

The majority of Guyla consumers indicated that they were concerned with technological aspects of pottery production when choosing pottery. Consumers who either preferred Birbir subdistrict/*mota* or the village of Guyla pots stated that both were preferred because they were strong pots that lasted a long time (Table 4-12). All of the Guyla consumers who prefer Birbir pots gave opinions based on technological aspects of either pottery use (i.e., strong: lasts a long time) or production (i.e., clay

quality and fire the pots for a long time). Among the Guyla consumers, 7 percent stated that they preferred Guyla pottery because they could exchange food for pots (a nontechnological reason).

Table 4-11: Reasons give for why Zuza consumers (n=44 households) prefer Zuza and Ochollo *dere* pots.

Percentage	Reason
	Consumers preferring Zuza pots (n=24)
29	Stronger: last longer, more durable
25	Proximity
17	Clay quality
17	Quality of work
17	Dry the pots for a long time
8	No reason
	Consumers preferring 2 or more of the Ochollo *dere* pots (Zuza, Kia, Denkarar, Doma) (n=20)
40	Strong: last longer, more durable
35	No reason
15	Clay quality
15	Proximity
5	Dry the pots for a long time

Thus, we have two groups of consumers in Guyla: (1) the group that prefers Birbir pots and who are more interested in technological aspects of pottery use and production; and (2) the group that prefers Guyla pots and who have mixed opinions concerning technological and nontechnological elements of pottery production and distribution. Consumers who purchase Birbir pots must walk 10 kilometers one way to the weekly Ezo market, where Birbir potters sell their pots. Consumers who live in Guyla can visit the small weekly Leesha subdistrict/*mota* market located in the village of Guyla to buy or exchange food for Guyla pots.

Table 4-12: Reasons given for why Guyla consumers (n=51 households) prefer Birbir and Guyla pots.

Percentage	Reason
Consumers preferring Birbir Pots (n=36)	
56	Stronger: Lasts a long time
39	Quality of Clay
6	Fire the pots for a long time
Consumers preferring Guyla pots (n=15)	
56	Stronger: Lasts a long time
20	Proximity
7	Quality of Clay
7	Able to exchange pots for food
6	Only buy Guyla pots

Etello village

Unlike the villages of Zuza and Guyla, the village of Etello has no potters in the village. Etello consumers must travel to one of the markets to purchase pottery. There is a direct relationship between which market the Etello consumers visit and the kind of pottery they can purchase, as Gamo potters usually go to specific markets. The Guyla potters usually go to the Leesha, Pango (Doko Mesho), or Zada markets, and so the Etello consumers who prefer Guyla or Zada pots (n=12) must go to one of these three markets. Etello consumers who prefer Birbir pots (n=40 households) must go to Ezo, which is the closest market for the sale or trade of Birbir pots (Table 4-13).

In the 52 Etello households surveyed, 77 percent (n=40) prefer Birbir pots and only 23 percent (n=12) prefer either Guyla or Zada pots. Consumers who prefer Birbir pots provide only technological reasons for their preference. These reasons are related to either use (i.e., stronger: long lasting) or production (i.e., either the quality of the clay, potter's work, or fuelwood). The majority of consumers who prefer Guyla or Zada pots do so because of proximity, since they can purchase these pots at the Doko

Table 4-13: Reasons given for why Etello consumers (n=52 households) prefer Birbir and Zada or Guyla pots.

Percentage	Reason
	Consumers preferring Birbir pots (n=40)
50	Stronger: Lasts a long time
30	Quality of Clay
13	Potter's Quality of Work
7	Quality of Fuelwood
	Consumers preferring Zada or Guyla pots (n=12)
50	Proximity
25	Stronger: Lasts a long time
17	Only Buy Zada or Guyla pots
8	Cheap
7	Potter's Quality of Work
8	Quality of Clay

Mesho market, only a six kilometer round-trip walk from Etello. Another nontechnological reason for preferring Guyla or Zada pottery is that they are cheaper than Birbir pots. Reasons for preferring Guyla or Zada pottery are based either on distribution (i.e., proximity), production (i.e., stronger: long lasting or the quality of the potter's work or clay), tradition (i.e., only buy Zada or Guyla pottery), or economics (i.e., inexpensive).

Household Origin of Ceramics

My research indicates that individuals do not always purchase pots from the particular potter/village that they prefer. I recorded the origin of each ceramic vessel in 20 households in each of the villages of Zuza, Etello, and Guyla.

Zuza village

Zuza consumers' preference for Zuza pots is reflected in their actual use of Zuza vessels. Figure 4-6 indicates the number of pots and their manufacturing location among the 20 Zuza households. From the 346 pottery vessels inventoried, I was able to obtain information on 329 vessels concerning where they were manufactured. Just over half (55.9 percent) of the vessels used were manufactured in Zuza. This reflects the strong patron-client relationship that occurs in Zuza between the *mala* and *mana* households.

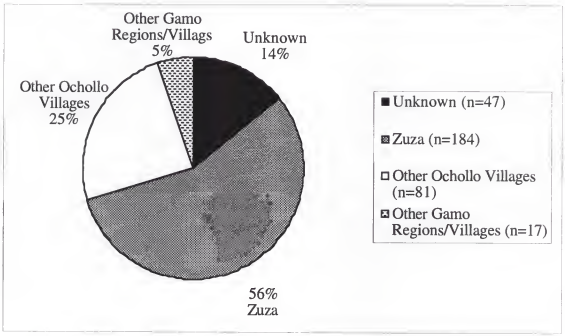

Figure 4-6: Relative frequencies of pots in 20 Zuza households by source of manufacture illustrating their preference for Zuza and Ochollo *dere* pots.

The unknown category is a reflection of informants not knowing where the pot was manufactured, primarily because the informant's mother-in-law had purchased the

pot. In addition, almost a quarter of the pots (24.6 percent) used in Zuza came from other Ochollo village potters, which reflects that consumers and potters living in Ochollo do most of their purchasing of pots in the Ochollo market. The fact that Zuza consumers purchase the majority of their pots in Ochollo is strengthened by the fact that only 5.2 percent of the used pots came from areas outside of Ochollo.

Guyla village

The household inventory of pots from 20 households in Guyla indicates that almost three-fourths (71 percent) of the pots were produced in Guyla. Although consumers in Guyla prefer Birbir pots (see Table 4-12), only 15 percent of the pots were produced in the Birbir region (Figure 4-7). This indicates that even though a majority of people prefer Birbir pots, proximity seems to be a stronger reason for consumers to purchase Guyla pots. In addition, the patron-client relationship between the farmer (*mala*) and potter (*mana*) is longstanding in Gamo society, where the *mala* households purchase a majority of pots from a specific potter (see Figure 4-5). The consumers in Guyla had the lowest percentage of pots that were in the unknown origin category (3 percent) compared to Etello (13 percent) and Zuza (14 percent). This possibly is due to the higher number of Guyla informants living in the household for a longer period of time than the informants do in Etello or Zuza.

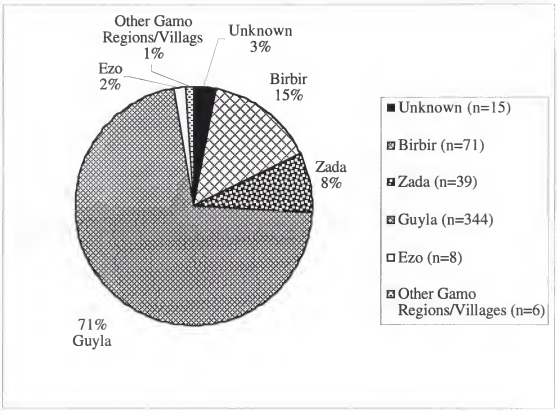

Figure 4-7: Relative frequencies of pots in 20 Guyla households by source of manufacture illustrating that they tend to purchase locally made pottery (Guyla) even though they prefer Birbir pots.

Etello village

The pottery inventory data indicate a difference between the preference and actual use of pottery among Etello consumers. The household inventory of pots from 20 households in Etello indicates that the highest percentage of pots are manufactured in Zada (32 percent) (Figure 4-8). This is a result of women traveling to the Doko Mesho market where the majority of Zada pots are sold. Although the majority of the Etello consumers prefer Birbir pots (see Table 4-13), less than one-fifth (18 percent) of the consumers from Etello use Birbir pots.

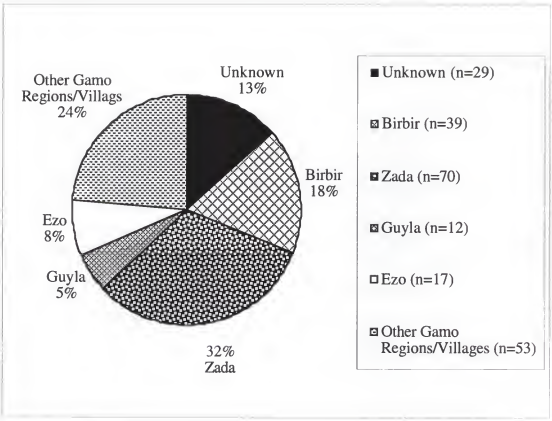

Figure 4-8: Relative frequencies of pots in 20 Etello households by source of manufacture illustrating that pots are purchased from many Gamo regions.

Gamo women purchase most of their ceramic vessels from the markets. Therefore, where women grow up and then live after marriage may affect their market choice. The majority of women who are married and live presently in Zuza were raised in Ochollo kebele. This may explain Zuza women's preference and use of Zuza and other Ochollo village pots. The majority of Etello women come from either Etello or neighboring villages (within the Doko Gambela or Doko Mesho regions of Doko) and market at Doko Mesho, Chencha, or Ezo. There are several possible reasons why the use of Birbir pots in Etello does not correspond with the percentage of consumers

who prefer Birbir vessels. First, since Birbir pots are sold only at the Ezo market distance may be a problem. Women who have small children stated that they can not travel to distant markets like Ezo because of the time it takes away from child care. In addition, elderly women who have health problems stated that they are not able to travel to Ezo and must purchase their pots at closer markets such as Doko Mesho or Chencha. Second, Birbir pots are more expensive than pots made in other regions such as Guyla. The majority of the Guyla women were born in villages near to Guyla, therefore they are familiar with the use of Guyla pots. As with the Etello consumers, Guyla women are not always able to travel to the Ezo market where Birbir pots are sold, because of their household responsibilities.

Consumers know which potters manufacture the strongest pots as the use-life analysis indicates in Chapter 7. However, consumers are not always able to purchase these pots due to a number of reasons including, (1) a long-term patron-client relationship; (2) household responsibilities; and (3) cost constraints.

Vessel Cost

The cost of vessels varies depending on its type and where it was produced. Large storage jars (*batsa*) are the most expensive type for potters to produce and consumers to purchase (Table 4-14). The production of *batsas* takes more clay than for other vessel types. *Batsas* take one month to dry and more fuel wood is needed to fire the *batsas* than other vessel types. In addition, after considerable investment in the production process of *batsas*, there is no guarantee of a successful firing.

Table 4-14: Cost (birr) of vessel types in Gamo society.

	n	Mean (birr)	Median (birr)	Range (birr)
Jebana (coffee pitcher)	50	1.43	1.50	0.50 - 3.00
Diste (cooking pot)	49	1.81	1.50	0.40 - 6.00
Otto (cooking, transporting, storage jar)	240	3.36	3.00	0.30 - 11.00
Tsaro (cooking jar)	131	1.14	1.00	0.10 - 8.00
Shele (serving bowl)	141	2.12	1.50	0.10 - 18.00
Bache (baking plate)	31	3.91	3.00	1.00 - 15.00
Tsua (serving jar)	56	0.55	0.50	0.10 - 2.00
Batsa (storage jar)	48	14.02	10.50	0.35 - 50.00
Guya (water pipe)	21	1.85	2.00	1.00 - 3.50
Peele (serving dish)	28	2.18	1.75	0.10 - 6.00
Gumgay (washing bowl)	4	3.12	3.50	0.50 - 5.00
Kolay (cooking and serving jar)	2	0.5	0.50	0.10 - 1.00
Tayche (cooking and serving jar)	3	0.56	0.50	0.50 - 0.70
Total	804	2.94	2.00	0.10 - 50.00

Batsas are expensive to buy because they are the most expensive to manufacture. The average price for *batsas* among Zuza, Etello, and Guyla consumers is 14.02 birr. This compares to 2.93 birr for the average price of 804 vessels of all types from the three villages. Cost data were not available for vessels purchased before the wife came to live in the household, purchased by someone who died, or purchased through barter.

The cost of ceramic vessels is dependent upon where it is manufactured. The most expensive pots, based on a sample size of at least 20 vessels, come from the Birbir region with a mean cost of 4.39 birr. The least expensive region that produces vessels is Zuza with a mean cost of 1.81 birr. The reason for the high cost of Birbir pots is partly based on their popularity with consumers. A majority of Guyla and Etello consumers prefer Birbir pots (see Tables 4-12 and 4-13). In addition, the

number of Birbir *batsas*, the most expensive type of vessel, was less than the number of *batsas* manufactured by Zada and Guyla potters. This is because the majority of consumers could not afford *batsas* produced by Birbir potters, but can afford *batsas* manufactured by Zuza and Guyla potters.

Caste Ceramic Distribution

There are three Gamo caste groups: *mala*, *mana*, and *degala,* which have different occupations, access to land, and social and economic standing (see Chapter 2). The *mala*, *mana*, and *degala* castes purchase different types of pots and from different villages/regions because of their different social status, income, and marriage patterns (i.e., wife's origins).

Caste and Expenditure on Pots

The mean expenditure on pots for different caste households suggests that the *mala* caste households spend more on pots than the *degala* caste households. All *mana* households in both Zuza and Guyla villages use their own wares so it is not possible to compare them to other caste households.

Among the *mala* households in Etello, the average cost for vessels is 2.82 birr with a range of 0.10 to 30.50 birr (Figure 4-9). The *degala* households in Etello spend on average 2.21 birr with a range of 0.25 to 4.00 birr. In Guyla, the *mala* spend on average 3.93 birr with a range of 0.20 to 50.00 birr. The *degala* households in Guyla spend on average 2.26 birr with a range of 0.20 to 10.00 birr. Thus, artisans spend less on pots than do farmers.

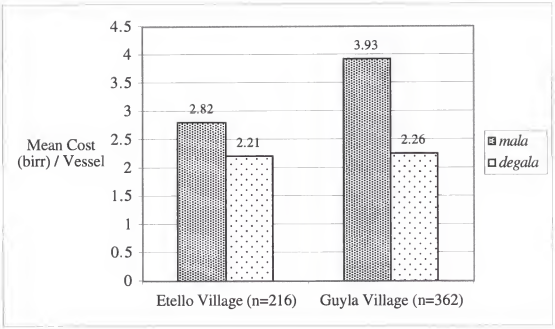

Figure 4-9: Mean cost (birr) of pots in Etello and Guyla illustrating the *degala* caste spends less on ceramics than the *mala* caste group.

Caste and the Origin of Household Ceramics

Artisan households tend to purchase less expensive pots than *mala* households. However, in areas where artisans own more land and are subsequently wealthier, they are able to purchase more expensive ceramics.

Etello village

In Etello, the *mala* caste households purchase a higher percentage of pots (19 percent) from Birbir potters compared to the *degala* caste households (5 percent) (see Figure 4-10). The *degala* households tend to buy pots produced in Guyla (25 percent), unlike the *mala* households (3.5 percent). Zada and Guyla potters visit the Doko

Mesho market weekly to sell their wares, and Etello's *degala* go to these markets to sell and purchase products, one of which is ceramic pots. In contrast, Etello's *mala* households seem to purchase a higher percentage of Birbir and Ezo manufactured pots, which are sold at the Ezo market. Therefore in Etello, the *mala* tend to purchase Birbir pots, which are more expensive than Guyla pots. The higher percentage of pots that are in the unknown category among the *mala* households (14 percent) is the result of the postmarital residence rules where the informant came to live at her husband's house after the vessel was purchased. In addition, the *mala* households have a higher percentage of vessels that are older than the *degala* vessels (see Chapter 7).

Guyla village

The higher percentage of pots among the *mala* households coming from Guyla is an indication of the strong patron-client relationship that occurs between the Guyla *mala* and *mana* households (Figure 4-11). However, in Guyla the differences between the *mala* and *degala* distribution of ceramics is not as dramatic as among Etello's caste. This is because Guyla has potters that both castes can purchase pots from and Guyla's *degala* households own farmland and are not as economically deprived as *degala* households living in other Gamo villages (i.e., Etello's *degala*). Although Guyla's *degala* members have farmland and have more economic opportunities than other *degala* members, they still are considered as social outcastes by Guyla's *mala* members.

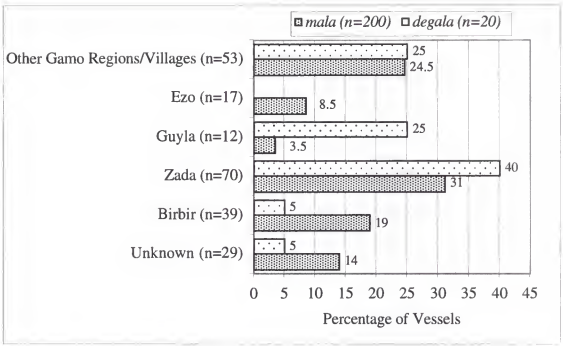

Figure 4-10: Relative frequencies of pots in *mala* and *degala* households in Etello by source of manufacture (n=220).

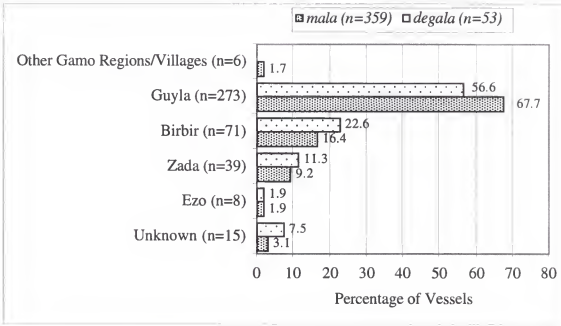

Figure 4-11: Relative frequencies of pots in *mala* and *degala* households in Guyla by source of manufacture (n=412).

Zuza village

Zuza is not considered in this analysis because it is comprised of only *mala* and *mana* households. The Zuza *mana* households produce all of their own vessels, so a comparison of vessel cost is not possible.

The differences in household ceramic distribution between the different caste households reflect Gamo's strict social hierarchy, especially concerning their economic status. People's perceptions concerning ceramic production have an important affect on how pots are distributed across households.

Economic Rank Ceramic Distribution

As defined in Chapter 3, economic rank in Gamo society is based on: (1) the number of different occupations; (2) the number of household buildings; (3) the presence or absence of livestock; (4) the presence or absence of farmland; and (5) the number of wives living in a household.

Economic Rank and Expenditure on Pots

As with the caste households, wealthy households spend more on ceramic vessels than households with less wealth. This holds true for Zuza and Guyla, but in Etello, the first-ranked households spend less on ceramic pots than do the lower economic ranked households. In Etello, the second-ranked households (3.13 birr) spend the most and the first-ranked households (2.21 birr) spend on average less than the lower two ranked households (see Figure 4-13).

Economic Rank and Household Origin of Ceramics

The poorest households (Rank 3) purchase a higher percentage of their pots from potters that sell their pots at cheaper prices, than the wealthier households. However, the origin of household ceramics is also related to the origin of the household wife.

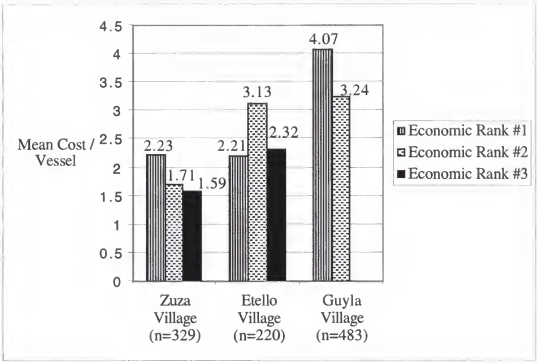

Figure 4-13: Mean cost (birr) of pots in Zuza, Etello, and Guyla by economic rank illustrating that higher economic ranks generally spend more on household ceramics.

Zuza village

As stated earlier, most Zuza households purchase their ceramics from Zuza and Ochollo potters. Most of the first- and third-ranked households maintain the village trend by purchasing Zuza pots. However, the second-ranked households purchased

fewer pots from Zuza potters and more pots from other potters (Figure 4-14). When looking at the social makeup of the second-ranked households it becomes clear that the reason they have fewer pots from Zuza is because they have stronger social ties to other Ochollo regions. One household's mother's brother is the *Koa* (ritual sacrificer) of Ochollo and so they have social obligations not only to Zuza but also to all Ochollo villages. A second-ranked household informant that has no Zuza vessels was raised in Ochollo Dinkarar/Moye and has a number of pots from that village even though she prefers Zuza pots. Another informant, who has no Zuza vessels, prefers Ochollo Kia pots and so purchases her vessels from Kia potters at the Ochollo market.

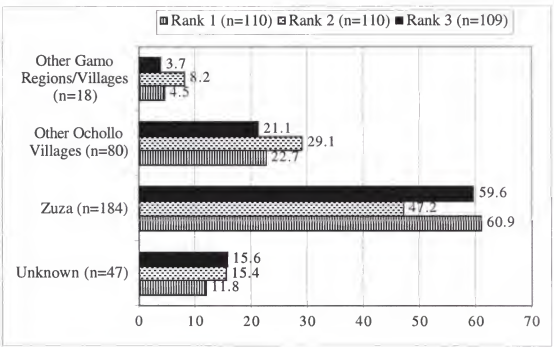

Figure 4-14: Relative frequencies of pots in economic rank households in Zuza by source of manufacture.

Etello village

Unlike Zuza, the Etello households purchase vessels from a variety of sources. The ceramic distribution among different economic rank households in Etello shows that the first-ranked households have a higher percentage of vessels purchased from Birbir and Ezo potters than either the second- and third-ranked households (Figure 4-15). This indicates that the first-ranked households can afford to purchase the higher priced Birbir pots. The second- and third-ranked households have a higher percentage of vessels from Zada and the third-ranked households obtain more vessels than the

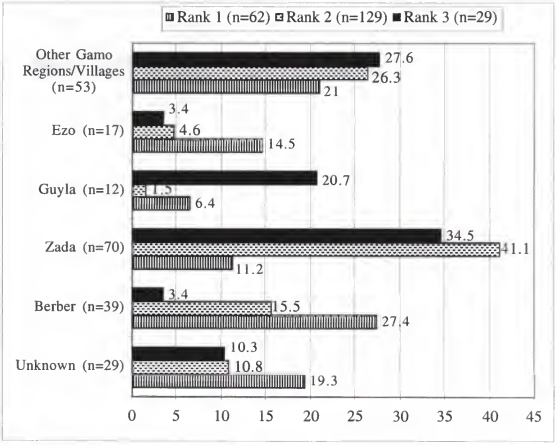

Figure 4-15: Relative frequencies of pots in economic rank households in Etello by source of manufacture.

other two ranks from Guyla. This suggests that the second- and third-ranked Etello households purchase more of their vessels from the Doko Mesho market where both Zada and Guyla potters sell their wares.

Guyla village

There are only two economic ranks in Guyla based on the criteria discussed above, which indicates that Guyla households are generally wealthier than Zuza and Etello households. The two economic ranks in Guyla have similar percentages concerning the potters from which they purchase their ceramic vessels. As expected, the wealthiest households (Rank 1) purchase a little over twice the percentage of their vessels from Birbir potters than do the second-ranked households. The second-ranked households purchase a higher percentage of their pots from Guyla potters, but it is remarkable the consistency between the two economic ranks concerning from whom they purchase pots (Figure 4-16).

The economic wealth of Gamo households influences the purchasing of a household's ceramic assemblage. The dispersal of household wealth throughout the village reflects differences in the distribution of ceramics that are manufactured and sold in various Gamo villages or regions.

Summary and Conclusions

This study of Gamo production and distribution of ceramics provides insights for archaeologists concerned with regional and socioeconomic relationships. Gamo potters belong to a submerged caste group that manufactures ceramic vessels full time

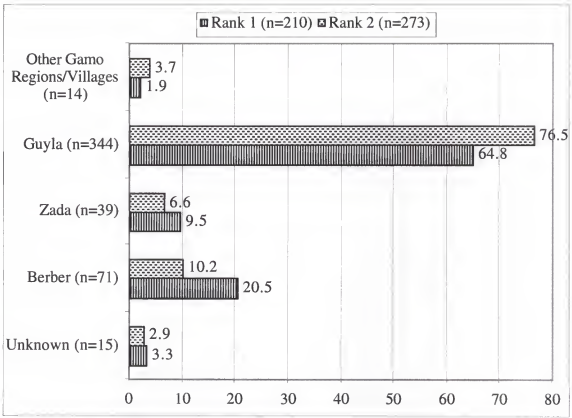

Figure 4-16: Relative frequencies of pots in economic rank households in Guyla by source of manufacture.

throughout the year. Production decreases only during the second (heavy) rainy season. Gamo potters manufacture pots for their economic needs, but most importantly, they are socially linked to the occupation of potting by their caste. Since many potters do not own farmland to fulfill a portion of their economic needs, mothers and mothers-in-laws teach their daughters how to manufacture pots. This ensures that their daughters will have an economic livelihood while they are apprentices and when they move to their husband's households. In contrast, Deal (1998:29-30) reports that two generations ago Maya potters were more likely to learn from their mothers-in-laws because they married at age 11 or 12, but presently a majority of potters have

learned from their mothers. Herbich's (1987:200) research among the Luo of Kenya indicates that women marry young and learn how to manufacture pots from their mothers-in-laws, rather than from their mothers. Gamo potters learn through informal instruction by watching and conducting chores such as gathering water, cleaning and pounding the clay, and over time practicing how to make small pots. This type of informal instruction is also conducted among the Maya (Deal 1998:27; Hayden and Cannon 1984); the Kalinga (Longacre 1981:60); the Huichol of northern Mexico (Weigand 1969:31-32); the Atzompa of southern Mexico (Hendry 1992:100); and the Hopi of the American Southwest (Stanislawski and Stanislawski 1978:72).

Even though potters learn two different microtraditions, one from their mother's household and village and one from mother-in-law's household and village, the ceramic forms and designs reflect those in which they reside. The majority of Gamo potters believe they produce pots similar to those of their teachers (e.g., mother and mother-in-law). Gamo potters tend to work alone or with their family members, which is similar to Maya potters, except that among some Mayan communities potters manufacture "in an almost assembly-line manner" (Reina and Hill 1978:21). Hence, archaeologists looking at ceramic materials can discern the village or regional origin of ceramic materials based on form and decoration.

It should be possible for archaeologists to determine the range of socioeconomic relations in a region based on ceramic analysis. Each potter or each village of potters uses a unique clay source that should be mineralogically distinct from each other. Therefore, the distance between producer and consumer can also be estimated. Gamo potters living in the same village often procure their clays and

tempers from the same sources. However, some potters living in the same village will mine their materials from two distinct sources. The Guyla potters do not share their clay sources because of competition and the fear that the clay source will become depleted. Both Guyla and Zuza's potters extract their clays and temper from within six kilometers of their village. This agrees with D. Arnold's (1985:39-52) worldwide sample of potters that indicates a majority of potters collect their clay within seven kilometers of their village and 33 percent of the world's potters collect within one kilometer of their production site. This is not surprising given the amount of labor involved in transporting clay from the sources.

Archaeologists should be aware that ethnographic studies indicate that potters will select less quality clays that are closer to their production area rather than clays that are of higher quality but farther away (P. J. Arnold 1991:23; Davison and Hosford 1978; Haaland 1978:49; Rye and Evans 1976:126). Hence, proximity of the clays and tempers maybe more important than their quality.

Gamo potters use different clays and tempers based on several social, economic, and technical factors. The low social status of Gamo potters makes it difficult for some potter communities to find suitable clays because some farmers will not allow potters to dig for clay on their farmland. This problem has resulted in some potters having to change from four clays to only one clay (e.g., Ezo Shasha potters). Zuza potters must pay taxes to the government for their clay. Other conditions that affect the types of clays used are geological factors such as the high water table flooding sources used by the Guyla potters. In addition, Gamo potters stated that it is important to acquire the right mixture of clays and temper or else the pots will break

during production. The proximity and quality of clay sources as well as land ownership are important components in the use of particular clay sources throughout the world (Aronson et al. 1994:88; Handler 1963:315-316; Lauer 1974:143-144; Van de Velde and Van de Velde 1939:22).

Archaeologists examining household pottery within a village should explore the possibility of finding evidence of a patron-client system through examination of clay, form, and decoration at different households. Village households engaged in the patron-client system should have a majority of their household ceramic assemblage manufactured by a single potter living within the same village. Gamo villages with resident potters have a patron-client system (*mayla*) (e.g., Zuza and Guyla), but villages without potters do not have the patron-client system (e.g., Etello). The Gamo patron-client system in villages with potters has important ramifications for the origin of household pottery. In pottery-producing villages, most non-potter households purchase their pottery from a single potter. The Gamo patron-client system also influences the use of household ceramics (see Chapter 5). A strict caste hierarchy with a strong patron-client system also is found in Rajasthan (Kramer 1997) and Malwa (Miller 1985) regions of India. Gamo potters sell both to their village and at weekly markets to non-potter villages, which is also conducted among the Rajasthan and Malwa regions of India (Kramer 1997:123-124; Miller 1985:82-93).

To strengthen the argument that the patron-client system affects ceramic distribution, even if a household prefers long distance ceramics, most of their ceramics will reflect the purchase and use of local pottery. Hence, consumers are influenced more by proximity and socioeconomic relationships rather than technological choices.

Kalinga consumers, like the Gamo consumers, listed technological reasons rather than nontechnical reasons in deciding which pots to purchase. The Kalinga cite pottery strength and pot weight as their major reasons for purchasing particular vessels from Dangtalan and Dalupa villages, respectively (Aronson et al. 1994:98-102). The only predominant nontechnological reason given among Kalinga consumers who prefer a particular village water jar was that they were "nicely decorated" (Aronson et al. 1994:100). The Gamo consumers prefer pots because of their strength, so that weight and decoration of the pot was never given as a concern. Although Gamo consumers emphasize technological aspects of pottery, they usually purchase a majority of their pots from local potters, indicating that proximity and social relationships take precedence.

The variation in an archaeological household's ceramic assemblage may reflect the presence and absence of village potters. Villages without potters should have a wider range of ceramics with different clays, forms, and decorations. Gamo non-pottery-producing villages have a wider variety of ceramics from different areas than pottery-producing villages. Although Gamo consumers may prefer pots manufactured from specific villages/regions they are not always able to purchase pots they prefer. Gamo consumers purchase the majority of their pots from potters living in their village or from markets that are in close proximity to their village, rather than travelling to a distant market to purchase preferred pots. A vessel's cost is another important element determining which pots people purchase, because the more preferred pots are the most expensive, and many consumers cannot always afford them. Hence, social and

economic context influences the consumer's choice. The higher caste and wealthiest households purchase more expensive pots than lower caste and poorer households.

The integration of procurement, production, and distribution of ceramic vessels in association with the regional, social, and economic context of Gamo society provides a model for archaeologists to interpret ceramic assemblages better at the household level. The social condition of potters influences their reliance on their craft for an economic livelihood and determines what types of materials they use. At the village level, the social makeup determines the relationship between ceramic producers and consumers. Consumers living in villages with potters can either use the patron-client or market systems to procure their household ceramic vessels. Consumers living in villages without potters are able to obtain their household pots only from the weekly markets, causing households to have a higher percentage of pots produced from different regions than consumer households that have potters living in their village. The next chapter further integrates the life-cycle of Gamo pots by focusing on the use and discard of household pots at the scales of village, caste, and economic rank.

CHAPTER 5
THE SOCIAL AND ECONOMIC CONTEXT OF CERAMIC USE AND DISCARD

Ethnoarchaeological studies of household ceramic use and discard have provided archaeologists with models applicable to archaeological household subsistence, demography, social and economic status, and social interaction (e.g., Deal 1985, 1998; Deal and Hagstrum 1995; Miller 1985; Nelson 1991; Stanislawski 1969). The use and discard of a household ceramic assemblage is dependent upon the interaction between ceramic producers and consumers, and thus is reliant upon the household's social and economic relationships.

This chapter organizes the analysis of household ceramics into three units of socioeconomic context important to the Gamo: (1) villages; (2) castes; and (3) economic wealth. Gamo households still rely on Gamo produced ceramic vessels to prepare their food. Furthermore, the ceramic types that potters produce are dependent upon the demands from the consumers concerning the types of foods consumers eat. The village analysis demonstrates ceramic assemblage differences between Etello, a non-pottery-producing village, and Zuza and Guyla, two pottery-producing villages. The analysis concerning the social status and economic wealth of households indicates that the frequency and function of household pots are the most reliable indicators of a household's social status and economic wealth.

Village Ceramic Use and Discard

I conducted a study of ceramic use and discard in the Gamo villages of Zuza, Etello, and Guyla (see Figure 2-1). Zuza (2,100 meters) is located in the *baso* ecological zone where the predominant crops grown are enset, corn, cabbage, coffee, and tobacco. Zuza is one among seven villages that are in Ochollo *dere*. Zuza sits at the top of the ridge that comprises the Ochollo *dere* overlooking the rift valley lakes of Abaya to the east and Chamo to the southeast. The villages of Etello (2,400-2,500 meters) and Guyla (2,500-2,800 meters) are located in the *dega* ecological zone. Enset, wheat, barley, potatoes, beans, and peas are the primary crops grown in both villages. Etello is one of the 11 villages in the Doko Kalay *mota* of Doko *dere*. The majority of Etello's household compounds are situated along the Itsomighty River Valley, but some compounds also border the road leading to Doko Mesho. Guyla is one of the seven villages of Zada *dere* in the Leesha *mota*. Guyla is located along the north side of the Sura Ridge.

Industrial Types

The replacement of ceramic with industrial types among the Gamo people has not had the dramatic effects that have been witnessed in other parts of the world (Birmingham 1975:385; Sargent and Friedel 1986:192; Skibo 1994:117). Industrial types are more common in the villages of Zuza and Etello than they are in Guyla because Guyla is geographically more remote. The only type of industrial vessel that has completely replaced a Gamo ceramic form is the Chinese porcelain, which most of Ethiopia uses as a coffee cup. All of the inventoried Gamo households have replaced

the ceramic coffee cups with the Chinese porcelain cups, so no attempt was made to include them in the household inventory. Another common type of industrial container in use among the Gamo people is the plastic container people use to collect and transport water. Trucks from Kenya transport large quantities of these plastic water containers and distribute them into the Ethiopian hinterland. In the future, these plastic water containers may completely replace ceramic water jars. However, presently the Gamo use both ceramic water jars and plastic water containers to store and transport their water. Other types of industrial containers are small plastic bowls and drinking cups, as well as metal cooking pots, coffeepots, and baking plates.

In Zuza, a popular industrial type is the plastic water container, which is in use in 50 percent (n=10) of the households inventoried. The use of the plastic water container makes it easier for these people to transport water, especially the people who live in Zuza. The people with houses on the crest of the Ochollo ridge, Zuza, must walk down a 20 to 40 meter steep rocky ridge to a well, which is their closest water source. Only one Zuza house has a large assemblage of industrial vessels, predominantly metal cooking vessels. The adults in this household still use a ceramic jar to transport water, while the children use a plastic container. Another Zuza person stated that she uses plastic bowls instead of the ceramic serving bowls (i.e., *shele* and *peele*) because they last longer.

Etello uses more industrial vessels than either Zuza or Guyla, as Etello is located close to the town of Chencha, which has many small stores that sell metal and plastic containers. In Etello, 90 percent (n=18) of the households inventoried use some type of industrial container. Plastic containers are the most common type used in

Etello but a larger variety of both metal and plastic containers also are used. Two reasons why Etello households have more industrial containers than either Zuza or Guyla is: (1) there are no potters living in Etello and (2) their proximity to the town of Chencha. Etello consumers can travel to Chencha to purchase industrial containers and there is not the patron-client relationship between pottery producers and consumers that is evident in both Zuza and Guyla. Although Etello uses more industrial type containers than Zuza or Guyla, Etello households still rely heavily on their household ceramic assemblage for everyday food processing.

Guyla has the least amount of industrial vessels of the three villages I studied, as plastic water containers, bowls, and cups are present in only 35 percent (n=7) of Guyla households. Among the 20 Guyla households inventoried, no one reported using metal containers. People living in the least accessible areas of the Gamo region (e.g., Guyla) are slower to change from the traditional ceramic vessels to the industrial containers. The cost of industrial types and their accessibility remain impediments to the technological change from ceramics to plastics and metals. In addition, the change to the industrial containers is hindered because people believe food tastes better when it is cooked, served, and stored in ceramic vessels.

Ceramic Frequency and Distribution

The vessel assemblages of the three Gamo villages of Zuza, Etello, and Guyla are distinct because of their different ecological locations, crops, and diets. The Zuza people have more coffee pots, stew pots, and baking plates than Etello and Guyla people. In Etello and Guyla, there are more types of serving vessels and water pipes than in Zuza.

Coffee pitchers are more common in the village of Zuza. This is a reflection of Zuza's ecological location, as many households are able to grow their own coffee. In contrast, in Etello and Guyla, people are not able to grow coffee because of the high altitude, and consumers must purchase coffee at the weekly markets. Coffee beans are one of the more expensive crops, costing approximately 10 birr/kg.

There are different types of cooking vessels in the three villages, which reflect their dietary habits. *Distes* (cooking pots) also are more common in Zuza households than in Etello and Guyla. Ninety-five percent of *distes* (cooking pots) present in Zuza households were produced by either Zuza or other Ochollo potters. Zuza's consumers eat more *wat* (a type of stew made with either lintels, chicken, or beef) than Etello and Guyla consumers, and *diste's* main function is for the preparation of *wat. Baches* (baking plates) also are more common among Zuza households. The Zuza people eat more maize bread and roasted maize, which is cooked on *baches*. In addition, a major crop grown by Zuza farmers is maize that cannot be grown in the high altitude areas. The number of Zuza households reporting eating maize food is much higher (n = 19; 95 percent) than in the villages of Etello (n = 6; 30 percent) and Guyla (n = 2; 5 percent). Etello and Guyla households eat more barley and wheat than do Zuza households. Although wheat and barley also is roasted, the majority of barley and wheat is combined with other ingredients and cooked in the *otto* (cooking jar). The demand for *baches* and *distes* among Zuza and Ochollo households is the primary reason why Zuza potters specialize in the manufacture of *baches* and *distes*. However, Guyla potters repeatedly stated that the type of clays mined by Guyla potters are not appropriate for *bache* manufacturing.

Table 5-1: Percentage of vessel types and their use in the three Gamo villages.

Emic Type	Zuza Percent / n	Guyla Percent / n	Etello Percent / n
Jebana (coffee pitcher)	8.7 / 30	4.5 /22	3.6 / 8
Diste (cooking pot)	11.3 / 39	2.0 / 10	5.4 / 12
Otto (cooking jar)	15.9 / 55	21.2 / 104	24.8 / 55
Otto (water storage/transport jar)	23.1 / 80	11.0 / 54	6.3 / 14
Tsaro (cooking jar)	13.6 /47	16.1 / 79	14.9 / 33
Shele (serving bowl)	8.4 / 29	19.6 / 96	25.7 /57
Bache (baking plate)	8.6 / 30	2.2 / 11	2.3 / 5
Tsua (serving jar)	4.7 /16	9 / 44	7.7 / 17
Batsa (storage jar)	8.9 / 31	9 / 44	6.7 / 15
Guya (water pipe)	0.9 / 3	3.3 / 16	4 / 9
Peele (serving bowl)	1.7 / 6	4.9 / 24	1.3 / 3
Gumgay (washing bowl)	0 / 0	1.2 / 6	0 / 0
Kolay (cooking and serving jar)	0.6 / 2	0 / 0	0 / 0
Sene (drinking cup)	0.3 / 1	0 / 0	0 / 0
Tayche (cooking and serving jar)	0 / 0	0.6 / 3	0 / 0

The location of villages in relation to local water sources effects their ceramic assemblages. Zuza (23.1 percent) has a dramatically higher percentage of water storage/transport jars (*ottos*) than Etello (11.0 percent) and Guyla (6.3 percent). The majority of Zuza households are located on the ridge crest, but their water well is located approximately 50 meters below this ridge crest, which forces people to climb the steep ridge to gather their water. The majority of Etello and Guyla households live adjacent to mountain streams.

Serving vessels such as *shele* (serving bowl), *peele* (serving dish), and *tsua* (serving jar), occur with a much lower frequency within Zuza households than in either Etello and Guyla households. The majority of Zuza people use wooden bowls instead of ceramic bowls for serving. The land surrounding Zuza is less densely occupied than the higher elevations of Etello and Guyla and provides for an abundant

supply of wood for the Zuza inhabitants. *Peele*s (serving dish) are more predominant in Guyla households with the majority produced by Guyla potters (87.5 percent).

The smallest jar (i.e., *tsua*), that is usually used for drinking, is less common among the Zuza people. Zuza people use gourds for drinking, rather than *tsuas*, which are used more in Etello and Guyla. There is a mean of 6.35 gourds per household among the 20 Zuza households inventoried, whereas in Etello, the mean number of gourds is 2.85 gourds and Guyla has a mean number of 1.3 gourds.

The water pipe, *guya*, is less common in Zuza than in Etello or Guyla. A logical explanation for the latter would be that there are more Protestants in Zuza. It is against the Protestant religion to indulge in smoking tobacco or drinking alcohol. However, there are only four inventoried Zuza Protestant households. The number of Protestants in Etello and Guyla is small with only three and two Protestant households, respectively. Therefore, religion is not the reason for the lower frequency of water pipes in Zuza. While working in the three villages, I did not experience people gathering to smoke the water pipe everyday in Zuza that I witnessed in both Etello and especially in Guyla (Table 5-1). It is surprising that Zuza households do not smoke tobacco since tobacco is more commonly grown in Zuza's ecological zone (i.e., *baso*) than in *dega* zone of Etello and Guyla. Tobacco in Gamo is a mixture of cooked tobacco leaves and cow dung. Cattle in Zuza and Ochollo *dere* are not as common as in the central Gamo region, which may explain the low numbers of *guyas* (water pipe) in Zuza households. Of the household inventoried there was only one cow reported in Zuza, but Etello and Guyla households had 31 cows in each village. In addition, the central Gamo region around the town of Ezo is known for its high quality tobacco.

Thus, the smoking of tobacco in different Gamo regions may be a result of economic, ecological, religious, and cultural factors.

Ceramic Life-cycle

Primary-use

The Gamo have four primary-uses for ceramics--cooking, serving, storage, and transporting. Gamo vessels fall into two distinct use categories: (1) pots that are usually used for a specific function (e.g., a *jebana* coffee pitcher only functions to boil coffee); and (2) types that have multiple functions as their primary-use (e.g., a cooking *otto* may primarily function as a cooking pot but it also may function to store and transport water). Pots that are used specifically for either cooking or serving are usually not used later for a completely different function. For example, a cooking pot is not secondarily used as a serving vessel or vice versa.

The percentages of ceramic types (Table 5-1) (vessels of the entire life-cycle) found in each of the villages is similar to the percentages of ceramic types for primary-use in each of the three villages (Table 5-2). However, there are two differences. Within Zuza, there is a much larger proportion of large storage jars (11.3 percent) or *batsa* than in either Guyla (3.2 percent) or Etello (2.2 percent). This reflects the developmental cycle of the household ceramic assemblage, as the Etello and Guyla households had not replaced their broken *batsas* (storage and beer processing jars). In addition, the low percentage of primary-use *batsa*s (storage jars) demonstrate that the majority of *batsa*s in both Guyla and Etello are in their reuse stage and function for storing crops and processing beer.

Comparing the frequency of primary-use vessel types to the total frequency of vessel types in each village demonstrates how their use influences their ubiquity in the assemblage (Table 5-3). As expected, the percentage of non-broken primary-use vessels, which are generally associated with cooking, is lower than primary-use serving or storage vessels. Storage vessels are expected to have a low breakage rate, but many of the *batsa*s (storage jars) in both Guyla (79.6 percent) and Etello (80 percent) are broken. This is due to: (1) a high cost of *batsa*s, making them difficult to replace after breaking; (2) the large percentage of broken *batsa*s used for storing crops; and 3) the high rate of breakage during primary-use from the wearing down of the vessel wall caused by the fermentation of beer (see Chapter 6 on discussion of use alteration analysis).

Because Etello has no resident potters, consumers must travel to the markets to purchase pots. I expected Etello households to have a lower percentage of non-broken primary-use pots because they may be more careful with their pots, compared to villages with potters such as Zuza and Guyla. However, there is only a slight difference between the three villages, with Etello surprisingly having only a slightly higher percentage (59.9 percent) of non-broken primary-use vessels when compared to Zuza (49.1 percent) or Guyla (52.8 percent). Etello's higher percentage of primary-use *shele*s (serving bowls) (89.4 percent) is the only type dramatically different from either the Zuza (68.9 percent) or Guyla (68.7 percent) assemblages (see Table 5-3).

Table 5-2: Percentage and frequency of primary-use vessel types found in three Gamo villages.

Emic Type	Zuza (n=168) Percent / n	Guyla (n=277) Percent / n	Etello (n=138) Percent / n
Jebana (coffee pitcher)	7.1 / 12	4.7 / 13	2.2 / 3
Diste (cooking pot)	8.3 / 14	2.5 / 7	2.9 / 4
Otto (cooking jar)	8.3 /14	14.8 / 41	18.8 / 26
Otto (water storage/transport jar)	25.0 / 42	10.8 / 30	8.7 / 12
Tsaro (cooking jar)	7.1 / 12	12.6 / 35	10.9 / 15
Shele (serving bowl)	11.9 / 20	23.8 / 66	36.9 / 51
Bache (baking plate)	8.9 / 15	1.4 / 4	.7 / 1
Tsua (serving jar)	5.9 / 10	12.3 / 34	9.4 / 13
Batsa (storage jar)	**11.3 / 19**	**3.2 / 9**	**2.2 / 3**
Guya (water pipe)	1.2 / 2	5.1 / 14	5.8 / 8
Peele (serving bowl)	3.6 / 6	5.4 / 15	1.4 / 2
Gumgay (washing bowl)	0 / 0	2.2 / 6	0 / 0
Kolay (cooking and serving jar)	.6 / 1	0 / 0	0 / 0
Sene (drinking cup)	.6 / 1	0 / 0	0 / 0
Tayche (cooking and serving jar)	0 / 0	1.1 / 3	0 / 0
Comparison to entire assemblage	48.5 / 168 (n=346)	56.5 / 277 (n=490)	62.2 / 138 (n=222)

In addition, the actual use of different ceramic types influence their breakage and replacement rates, because some types cannot be used for a secondary function. For instance, the *guya*, used as a water pipe, has a high percentage of primary-use among the village assemblages. It is not possible to reuse a broken water pipe to smoke tobacco and the *guya* has only one function (i.e., to smoke tobacco).

Table 5-3: Percentage and frequency of primary-use vessel types and their comparison to their respective type found in the three Gamo villages.

Emic Type	Zuza Percent / n (Entire Type Frequency)	Guyla Percent / n (Entire Type Frequency)	Etello Percent / n (Entire Type Frequency)
Jebana (coffee pitcher)	40.0 / 12 (30)	59.1 / 13 (22)	37.5 / 3 (8)
Diste (cooking pot)	35.8 / 14 (39)	70.0 / 7 (10)	33.3 / 4 (12)
Otto (cooking jar)	12.5 / 14 (112)	30.4 / 41 (135)	41.3 / 26 (63)
Otto (water storage/transport jar)	37.5 / 42 (112)	22.2 / 30 (135)	19.0 / 12 (63)
Tsaro (cooking jar)	25.5 / 12 (47)	44.3 / 35 (79)	45.4 / 15 (33)
Shele (serving bowl)	68.9 / 20 (29)	68.7 / 66 (96)	89.4 / 51 (57)
Bache (baking plate)	50.0 / 15 (30)	36.3 / 4 (11)	20.0 / 1 (5)
Tsua (serving jar)	62.5 / 10 (16)	77.3 / 34 (44)	76.4 / 13 (17)
Batsa (storage jar)	61.3 / 19 (31)	20.4 / 9 (16)	20.0 / 3 (15)
Guya (water pipe)	66.7 / 2 (3)	87.5 / 14 (16)	88.9 / 8 (9)
Peele (serving bowl)	100 / 6 (6)	62.5 / 15 (24)	66.7 / 2 (3)
Gumgay (washing bowl)	0 / 0 (0)	100 / 6 (6)	0 / 0 (0)
Kolay (cooking and serving jar)	50.0 / 1 (2)	0 / 0 (0)	0 / 0 (0)
Sene (drinking cup)	100 / 1 (1)	0 / 0 (0)	0 / 0 (0)
Tayche (cooking and serving jar)	0 / 0 (0)	100 / 3 (3)	0 / 0 (0)

Mending vessels

The Gamo mend vessels with a variety of materials (Table 5-4). The enset plant is the most common material for mending pots. Different parts used for mending pots include *etema*, juice from enset, rope (*gola*) made from enset leaves, and holes are stuffed with the inner part of the enset leaves. Another common mending material is cow dung usually used by itself or in combination with soil, cloth, or enset rope.

Among the 60 households inventoried, the percentage of broken vessels that are mended is 4.3 percent (N=487, n=21). It is expected that Etello would have more mended pots than Zuza and Guyla, because Etello has no potters living within the village and it is more difficult for consumers to obtain pots. Etello's assemblage

indeed contains the highest percentage of mended pots (12.3 percent, N = 89, n=11). The percentage of vessels from Zuza that are mended is 4 percent (N=174, n=7) and Guyla's percentage of mended vessels is the lowest of the three villages, with only 1.3 percent (N=224, n=3). The age range of all the mended vessels from the three villages are from one month to fifty years. Locally made pots were repaired as often as pots obtained from distant sources. Most mended pots are transporting or storage pots, particularly *ottos*. (Table 5-5).

Table 5-4: Absolute and relative frequencies of materials used for mending pots.

Type of Mending	n / percent of materials
Inner part of Enset Leaves	2 / 9.5
Etema	2 / 9.5
Shona (Wheat and Enset Porridge)	2 / 9.5
Enset Rope	2 / 9.5
Dung	1 / 4.8
Cow Dung and Enset Rope	1 / 4.8
Cow Dung and Soil	1 / 4.8
Cow Dung and Cloth	1 / 4.8
Burlap	1 / 4.8
Honey Comb	1 / 4.8
Frankincense	1 / 4.8
Nora (White Clay)	1 / 4.8
Cloth	1 / 4.8
Cloth Tied Around Neck to Hold Neck and Rim Together	1 / 4.8
Concrete	1 / 4.8
Tar	1 / 4.8
Plastic	1 / 4.8

The Gamo do not only mend pottery purchased from distant markets, but more frequently mend locally made pots. In the Zuza households, Zuza potters produced four of the mended pots, two other pots from Ochollo *dere* (Kia and Moye). Yet in

Etello, five of the mended pots came from the Birbir region, four from Zada, one from Gema, and one pot the owner was uncertain about its manufactured location. All three Guyla mended pots came from Guyla potters. Clearly, distance to the ceramic source/market is not affecting their decision to mend a vessel.

Table 5-5: Mended vessels by vessel type, function, frequency, and percent of mended vessels by village illustrating that the non-potter village (Etello) has a higher frequency of mended pots.

Village	Vessel Type and Function	Frequency / Percent of Mended Vessels
Zuza	*Otto* (transport water and store crops)	4 / 71.4
	Batsa (store beer)	1 /14.3
	Jebana (boil coffee)	1 / 14.3
Etello	*Otto* (cook and store butter)	4 /36.4
	Batsa (store beer)	3 /33.3
	Tsua (drink beer and cook)	2 /18.2
	Tsaro (cook and transport water)	1 /9.1
	Shele (serve and use as lid)	1 / 9.1
Guyla	*Otto* (store water and wind protector when firing pots)	2 / 66.7
	Shele (serve and store beer)	1 /27.3

The pots that were mended in the three villages were more expensive than the pots that were not mended. The average cost of pots from Zuza's 17 inventoried households, not including the three potter households, is 1.84 birr, but the average cost of the six mended pots is 2.75 birr (the cost of one vessel was not available). The average cost of Etello's pots is 2.77 birr, but the average cost of the mended Etello pots is 4.00 birr. The average cost of Guyla's pots is 3.71 birr but the average cost of the one mended vessel (where the cost information is available) is 7.00 birr. Therefore, the average cost of the mended vessels is more than the cost of the average non-

mended vessels from all three villages. This indicates that the cost of the pot is an important factor in the curation of ceramic vessels.

Although the number of reuse pots is small, compared to the larger village assemblage, mending vessels does indicate the importance that the reuse stage has in the overall household ceramic assemblage. The average cost of the mended vessels indicates it has an economic value to the household. The mending of vessels consists of a transformation between the primary and reuse stages, with curation prolonging the household use and value of the vessel.

Reuse

In this analysis, I consider the reuse of vessels as vessels that have been broken and then reused. Among the households inventoried in Zuza, Etello, and Guyla, 32.9 percent of the pots are reused within the household assemblages. In addition, we would assume that because Etello does not have potters, its households would reuse their vessels more than those of Zuza and Guyla, where potters live. However, the Etello vessel assemblage has only 23.4 percent reused broken vessels, compared to 31.8 percent for Zuza and 35.3 percent for Guyla households (Table 5-6).

There are differences between the three villages in the range of types that are the most and least common to reuse. The *otto* (store and transport water) is the most common reused vessel type in Zuza (27.3 percent), Guyla (24.8 percent), and Etello (21.1 percent). The reason the *ottos,* used for storing and transporting water, have a high reuse percentage in all three villages is because they are useful for secondary functions such as to store excess crops.

Table 5-6: Percentage and frequency of reused vessel types found in three Gamo villages illustrating *ottos* and *tsaros* (both jars) are the most common reused vessel types.

Emic Type	Zuza (n=110) Percent / n	Guyla (n=173) Percent / n	Etello (n=52) Percent / n
Jebana (coffee pitcher)	8.1 / 9	2.3 / 4	3.8 / 2
Diste (cooking pot)	11.8 / 13	0 / 0	5.8 / 3
Otto (cooking jar)	6.4 / 7	6.3 / 11	15.4 / 8
Otto (water storage / transport jar)	27.3 / 30	24.8 / 43	21.1 / 11
Tsaro (cooking jar)	13.6 / 15	20.2 / 35	13.5 / 7
Shele (serving bowl)	6.4 / 7	15.0 / 26	9.6 / 5
Bache (baking plate)	11.8 / 13	3.5 / 6	7.7 / 4
Tsua (serving jar)	4.5 / 5	5.8 / 10	7.7 / 4
Batsa (storage jar)	9.1 / 10	16.2 / 28	11.5 / 6
Guya (water pipe)	0 / 0	1.1 / 2	1.9 / 1
Peele (serving bowl)	0 / 0	4.6 / 8	1.9 / 1
Gumgay (washing bowl)	0 / 0	0 / 0	0 / 0
Kolay (cooking and serving jar)	0.9 / 1	0 / 0	0 / 0
Sene (drinking cup)	0 / 0	0 / 0	0 / 0
Tayche (cooking and serving jar)	0 / 0	0 / 0	0 / 0
Comparison to entire assemblage	31.8 / 110 (n=346)	35.3 / 173 (n=490)	23.4 / 52 (n=222)

Cooking vessels vary in their reuse among the three villages. The cooking *otto* is one of the least reused vessels in Zuza (6.4 percent) and Guyla (6.3 percent), but has a high reuse rate in Etello (15.4 percent). *Jebanas* (coffee pitchers) also are rarely reused in the three villages, Zuza (8.1 percent), Guyla (2.3 percent), and Etello (3.8 percent). When *jebanas* are reused after they break, they are turned on their side and placed on the hearth to boil coffee or are reused for storing crops, especially in Guyla. The *tsaro,* another type of cooking vessel, has a high reuse in Zuza (13.6 percent), Guyla (20.2 percent), and Etello (13.5 percent). People reuse *tsaros* by turning them on their side for cooking or to store crops. *Bache* (baking plate) is another type

exhibiting variation between the villages. After a *bache* breaks, it will be reused for roasting or baking breads.

It is also instructive to compare the types of ceramic vessels households reuse after breakage compared to vessel types people discard (Table 5-7). Guyla households (77.2 percent) reuse a higher percentage of their broken vessels than Etello. Surprisingly Etello (57.7 percent) reuses less of their vessels than both Zuza and Guyla. Etello households only reuse 46.1 percent of their broken *batsa*s (storage jars) compared to 100 percent and 87.5 percent for Zuza and Guyla households, respectively.

Certain vessel types (i.e., *jebana* [coffee pitcher] and *diste* [cooking pot]) such as small vessels like *jebana*s have a small rim orifice that makes them difficult to reuse for secondary functions such as for crop storage. These two vessel types, *jebanas* (coffee pitchers) and *distes* (cooking pots) are usually discarded or placed into provisional discard, until there is a need for a large sherd or to function as lids for larger storage jars. Large and small cooking jars (i.e., *ottos* and *tsaros*) provide a suitable form to reuse for storing crops after they break. The reuse of a vessel depends on its primary-use and form. Most of the pots that are reused are large expensive non-cooking vessels.

Discard

Provisionally discarded vessels, in this analysis, represent pots that informants stated were broken and had no further function. Discarded pots have either broken and immediately discarded it or recycled for a secondary function and eventually discarded. The ceramic consumers may someday find a function for these break them

discarded pots, which some have already been reused. However, they may eventually into large sherds that also may provide a household function such as carrying fire to the hearth or from one household to another to light a *guya* (water pipe) or used as lids for larger pots.

Table 5-7: Percentage of broken vessel types reused for secondary use among the three Gamo villages.

Emic Type	Zuza (n=110) Percent / n (# of Broken Pots for Each Type)	Guyla (n=173) Percent / n (# of Broken Pots for Each Type)	Etello (n=52) Percent / n (# of Broken Pots for Each Type
Jebana (coffee pitcher)	50.0 / 9 (18)	50.0 / 4 (8)	40.0 / 2 (5)
Diste (cooking pot)	52.0 / 13 (25)	0 / 0 (3)	37.5 / 3 (8)
Otto (cooking jar)	13.7 / 7 (52)	13.9 / 11 (79)	26.7 / 8 (30)
Otto (storage/transport jar)	55.7 / 30 (52)	54.4 / 43 (79)	36.7 / 11 (30)
Tsaro (cooking jar)	42.8 / 15 (35)	81.4 / 35 (43)	38.9 / 7 (18)
Shele (serving bowl)	77.8 / 7 (9)	86.6 / 26 (30)	83.3 / 5 (6)
Bache (baking plate)	81.2 / 13 (16)	85.7 / 6 (7)	100 / 4 (4)
Tsua (serving jar)	83.3 / 5 (6)	90.9 / 10 (11)	100 / 4 (4)
Batsa (storage jar)	100 / 10 (10)	87.5 / 28 (32)	46.1 / 6 (13)
Guya (water pipe)	0 / 0	100 / 2 (2)	100 / 1 (1)
Peele (serving bowl)	0 / 0	88.9 / 8 (9)	100 / 1 (1)
Gumgay (washing bowl)	0 / 0 (0)	0 / 0 (0)	0 / 0 (0)
Kolay (cooking / serving jar)	100 / 1 (0)	0 / 0 (0)	0 / 0 (0)
Sene (drinking cup)	0 / 0 (0)	0 / 0 (0)	0 / 0 (0)
Tayche (cooking / serving jar)	0 / 0 (0)	0 / 0 (0)	0 / 0 (0)
Percent of Broken Reused Pots / Number of Broken Reused Pots (Number of Broken Pots)	63.9 / 110 (172)	77.2 / 173 (224)	57.7 / 52 (90)

Guyla discards the lowest percentage of their vessels with only 7.7 percent of their entire assemblage, compared to 17.9 percent and 17.6 percent for Zuza and Etello, respectively (Table 5-8). There is a higher frequency of wealthier Guyla households than in Zuza and Etello, and these households use their broken pots for

storage of excess crops. The most frequent vessel type discarded in all three villages is *tsaro* (small cooking jar). The majority of *tsaro*s (small cooking jars) function for cooking activities and this type, as well as the cooking *otto*, usually succumbs to large cracks on the base of the vessel caused by repeated exposure to the hearth. As expected, Zuza discards a higher percentage of *jebana*s (coffee pitchers) and *diste*s (cooking pots) because they use these types more than the other villages. Etello discards a higher percentage of *batsa*s (storage jars) than either Zuza or Guyla. It is unexpected that Etello and I do not have an adequate reason why a village without potters would discard large expensive vessels (i.e., *batsas*) more than villages that have an easier access to potters.

Some vessel types (i.e., *shele* [serving bowl], *bache* [baking plate], *tsua* [serving jar], and *peele* [serving dish]) may only crack during use and therefore people then will continue to reuse them for the same primary function. *Bache*s (baking plates) will crack from continuous cooking, but because *baches* function for only roasting or baking and not to hold liquids, they can continue to function for cooking for an extended period of time. Serving vessels such as the *shele* and *peele* will crack from the rim to the base but continue to function for serving until the vessel eventually forms a large break. The *tsua* (serving jar) also has a low percentage of discard among the three villages. Thin cracks usually form along the rim, which does not hinder its ability to hold liquids for drinking.

Once a vessel has broken into sherds, people throw sherds into either the household garden or footpaths depending upon the household. Women sweep the compound clean at frequent intervals and so I rarely witnessed the accumulation of

sherds. However, a common sight along the footpaths of all villages is imbedded sherds. The sherds are repeatedly walked over and they become part of the pathway. This accumulation of sherds in the footpaths provides people with traction during the rainy season. This type of formational process is especially noticeable in Zuza and Ochollo *dere* where water from pumps run down the ridge into the footpaths, making walking slippery even during the dry season.

Table 5-8: Percentage of discarded vessel types found in three Gamo villages.

Emic Types	Zuza (n=62) Percent / n	Guyla (n=38) Percent / n	Etello (n=39) Percent / n
Jebana (coffee pitcher)	14.5 / 9	10.5 / 4	7.7 / 3
Diste (cooking pot)	19.3 / 12	7.9 / 3	12.8 / 5
Otto (cooking jar)	12.9 / 8	26.3 / 10	28.2 / 11
Otto (storage / transporting jar)	11.3 / 7	15.8 / 6	2.6 / 1
Tsaro (cooking jar)	32.2 / 20	21.0 / 8	30.8 / 11
Shele (serving bowl)	3.2 / 2	10.5 / 4	2.6 / 1
Bache (baking plate)	4.8 / 3	2.6 / 1	0 / 0
Tsua (serving jar)	1.6 / 1	2.6 / 1	0 / 0
Batsa (storage jar)	0 / 0	10.5 / 4	17.9 / 7
Guya (water pipe)	0 / 0	0 / 0	0 / 0
Peele (serving bowl)	0 / 0	2.6 / 1	0 / 0
Gumgay (washing bowl)	0 / 0	0 / 0	0 / 0
Kolay (cooking and serving jar)	0 / 0	0 / 0	0 / 0
Sene (drinking cup)	0 / 0	0 / 0	0 / 0
Tayche (cooking and serving jar)	0 / 0	0 / 0	0 / 0
Comparison to Entire Assemblage	17.9 / 59 (n=346)	7.7 / 38 (n=490)	17.6 / 39 (n=222)

The village analysis indicates that because of ecological locations of villages, reflecting upon diet, cooking, and storage practices that within one society differences in the household ceramic assemblages do occur. People tend to mend more vessels that are expensive and in Etello, a non-pottery-producing village. The reuse and

discard analysis indicates that whether a vessel is used or not after it breaks, depends on how it was used during its primary-use and its form.

Caste Groups

The analysis of ceramic use and discard in association with the three Gamo caste groups, *mala*, *mana*, and *degala*, will provide the social context concerning household ceramic assemblages and caste groups. I expect that household ceramic assemblages will reflect Gamo's rigid caste system regarding differences in frequency, diet, and discard of household ceramics.

Frequency of Vessels

The frequency of vessels among the households of different castes is a measurement of vessel use, past or present (i.e., primary, reuse, and discard stages), that are associated with some form of food processing. Vessels used for pottery production are included in the analysis, except for wasters. The analyses indicate that there is a strong correlation, between caste status and the frequency of household vessels. However, the differences in the frequency of vessels between the different castes households is not significant because of the small number of artisan households. *Mala* households have more vessels in each of the three villages than both the *mana* and *degala* households (Figure 5-1).

The *mala* households of Guyla have a mean frequency of 26.1 vessels per household, which is dramatically more than the average number of pots in Zuza (18.1 ceramic vessels) or Etello's (11.9 ceramic vessels) *mala* households. Guyla's *mala*

households purchase a majority of their pots from Guyla potters. As discussed in Chapter 4, there is a strong patron-client relation in Guyla between the *mala* and *mana* households. This patron-client relationship also occurs in Zuza but is not as strong as in Guyla. Etello's *mala* households have fewer numbers of vessels per household because there are no potters living in Etello and so the *mala* must travel to weekly markets to purchase their household vessels. In addition, Etello is located near Tuka, which sells industrial type containers.

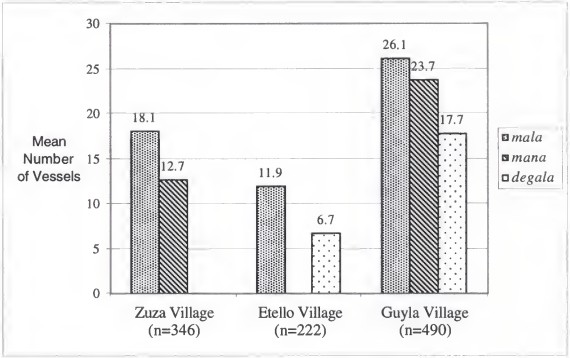

Figure 5-1: Mean number of vessels by caste and villages (see Appendix A for summary statistics).

Guyla's *mana* households own almost twice as many vessels per household with 23.7 than Zuza's *mana* households that only own an average of 12.7 vessels per household. The *mana* in Guyla have a larger household population with a mean of 6.3

people than the *mana* household of Zuza, which has a mean population of 4.3 people. One possibility is that the Guyla *mana* own more land than the Zuza *mana*, therefore they need more vessels for storing their crops.

As with the frequency of ceramic types, there is a dramatic difference between Etello and Guyla's *degala* households in the mean number of ceramic vessels per household. The large difference in the number of vessels owned between the two *degala* groups demonstrates the variation in households belonging to the same caste. The ownership of land is a critical economic factor that is reflected in household ceramic assemblages. Guyla's *degala* households need more ceramic vessels to process a more varied diet and also to store crops that they grow on their farmland, while Etello's *degala* do not own farmland and use a majority of their ceramic pots only for cooking. In Zuza, the *mana* own fewer pots than the *mala*. The *mala* caste in Zuza has a mean of 18.1 vessels and the *mana* caste households have a mean of 12.7 vessels. Potter households in Zuza have a large cache of wasters adjacent to their houses and scattered in parts of their compound. If wasters were included in the analysis then potter households in Zuza would have more vessels per household than Zuza *mala* households.

There is a dramatic contrast between the frequency of vessels owned between castes in Etello. The *mala* households of Etello have a mean of 11.9 vessels per household, compared to a mean of 6.7 vessels for the Etello *degala*. The Etello *degala* households have fewer number of pots due to their low status. The Etello *degala* have no land to farm and their only livelihood comes from selling scraped cowhides.

The frequencies of pots between the castes in Guyla also clearly indicate the Gamo social hierarchy. The *mala* caste in Guyla have a mean 26.1 vessels, whereas the means for the *mana* and the *degala* households is 23.7 and 17.7, respectively. The potter households in Guyla do not keep their wasters but deposit them in the footpaths and gardens. Although the trend is consistent throughout the three villages, the t-test results indicate they are not significant because of the large range of vessel frequency.

Vessel Types

The number of vessel types in a household is not a strong or significant indicator of social status in Gamo society (Figure 5-2). The *mala* own only slightly more vessel types in Zuza, with the *mala* in Guyla owning fewer ceramic types than the *mana* and *degala* households. In Etello, the difference in the frequencies of vessel types is considerable between the *mala* and *degala* households. The different castes eat a different variety of foods and the processing of foods affects the types of vessels in the different caste households.

In Zuza, the *mala* own slightly more vessel types than the *mana*. The *mala* caste in Zuza has a mean number of 6.9 types compared to a mean of 6.0 types for the *mana* caste. Among the Zuza castes, the biggest difference is that the Zuza potters (*mana*) do not own any of the large storage jars (*batsas*). However, the *mana* households do not have farmland and therefore do not need large storage jars for storing excess crops nor do they have enough grain to produce beer. Another difference is that the *mana* households own over twice the amount of serving bowls (*sheles*) than the *mala* households. This indicates that the *mala* households eat more

with the wooden bowls compared to the potters, who can easily produce their own serving bowls. Another example of Zuza potters (*mana*) producing their own wares instead of using another type of material is the difference in the frequency of *tsua*s (serving jars). The Zuza potters own just less than twice the amount of *tsua*s compared to *mala* households, which reflects the fact that *mala* households are using gourds for drinking instead of *tsua*s (serving jars). Both the Zuza *mala* and *mana* use the same amount of *otto*s for the transporting of water (i.e., 40 and 39.2 percent respectively). Only the Zuza *mala* households use their *otto*s for the transporting of beer, which they sell at the market (10.8 percent).

In Etello, the *mala* caste has a mean number of 5.9 types compared to only 3.7 vessel types among the *degala* households. *Degala* households do not own *jebana* (coffee pitcher), *bache* (baking plate), *tsua* (serving jar), *batsa* (storage jar), and *peele* (serving dish). The *jebana*, *peele*, and *bache* types are owned by less than 5 percent of *mala* households indicating that these types are not common among even the *mala* Etello households. *Batsa*s (storage jars) are not owned by the *degala* households because they do not own land and thus generate no agricultural surplus. Therefore, they have no need for large storage jars. Etello *degala* store food in smaller types such as *diste*s (coffee pitchers) and *otto*s (cooking/storage jars). *Jebana*s (coffee pitchers) are not present in the *degala* household assemblage because it is expensive to purchase coffee. The lack of *tsua*s among the Etello *degala* is due to one *degala* household owning plastic cups which two neighboring *degala* households borrow. Two types, the *otto* and *tsaro*, predominate in ceramic assemblages of the Etello *degala*, as these two types function primarily for cooking.

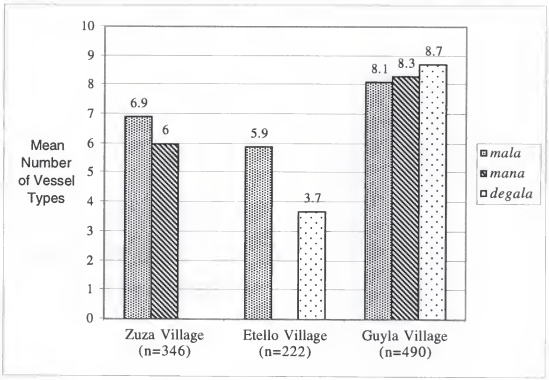

Figure 5-2: Mean number of vessel types by caste and villages (see Appendix A for summary statistics).

In Guyla, the *mala* caste households have a similar mean number of types (8.1) compared to the *mana* and *degala* with 8.3 and 8.7 mean number of types, respectively. The similar results of the mean number of vessel types among the Guyla castes indicate that all households use the vessels in normal daily activities. The differences that occur among the different Guyla caste households are somewhat reversed from Etello, since Guyla *degala* have the most number of *jebana*s (coffee pots) compared to the *mana* and *mala* households. The Guyla *mana* caste households have a higher percentage of *diste*s (cooking pots) than the other two castes. The Guyla *mala* caste households have a much larger percentage of *otto*s, than either the *mana* or

degala households. The most interesting phenomenon is that *degala* households do not use *otto*s but use *tsaro*s instead for their cooking. The *otto*s among *degala* households consist of only 1.3 percent of their assemblage whereas the *tsaro*s represent 26.4 percent of the assemblage. The *degala* households continue with the trend of having more than twice the percentage of *guya* water pipes in their assemblage than the *mala* households. Also, the *degala* households use more *gumgay*s (washing bowls) which are used to wash their feet. This may be a result of their trying to rid the idea on the part of the rest of Gamo society that they are "unclean".

Variation in the use of vessel types across castes provides insight on the variation in caste diet. Some households that are socially of low status have a limited dietary choice due to their poor access to land and money. For instance, boiling coffee beans is restricted to the *jebana* (coffee pitcher) type, but some households cannot afford coffee beans and will boil coffee leaves instead, using the *tsaro* (small cooking jar) rather than the *jebana* (coffee pitcher) type.

The higher frequency of water pipes (i.e., *guyas*) among *mana* and *degala* households in the three villages indicates that potters and hideworkers smoke more tobacco than do the *mala* people. This is due to some of the *mana* and *degala* castes not becoming Protestant and Ethiopian Orthodox church members, which ostracize artisans.

Foods in Gamo society are important indicators of wealth because certain foods such as butter, milk, meat, beer, and other ceremonial type foods are expensive and poorer households can not afford to process or buy these foods. The consumption of meat occurs only twice a year during religious holidays and lower caste households

usually do not eat meat, even during religious holidays, because it is so expensive. The use of a wider variety of cooking pots (i.e., *distes*, *ottos*, and *tsaros*) among the *mala* households, in all three villages, indicates that their diet is more varied than the diet of the *mana* and *degala* households. Although not statistically significant because of the small sample size of artisan households, Figure 5-3 indicates that higher caste households have a higher percentage of ceramic vessels that function for the processing of high cost foods.

The presence of the large storage jars or *batsa* among the *mala* households in Zuza and Etello, and their absence among the *mana* or *degala* households is a reflection of the differences in their diet. The large storage jars are predominantly in use for the processing of beer (i.e., *farso*), which is an expensive food to process considering the amount of grain it requires to produce an adequate supply. Although every Guyla caste has *batsas* in use, principally for the processing of beer, the analysis of foods consumed with the different vessel types by the *mana* and *degala* castes are less diverse and include fewer foods that are expensive to process. As discussed, wealthy *mala* households eat different foods, and therefore use their pots differently than poorer *mana* and *degala* households. A household with only a residing widow will eat less costly foods, and use vessels differently than a *Halaka* household with an extended family living in one large compound. Differences occur between the Zuza and Guyla *mana* in terms of owning *batsas*; the *mana* households in Guyla own *batsas*, but the Zuza *mana* do not. The reason is that Guyla potters own more farmland and can produce grain. Therefore, *batsas* contribute to the household's need for storing grain and fermenting beer. In contrast, the potters in Zuza do not own

farmland, making it expensive to purchase large amounts of grain for storage or for producing beer. The *mana* in Zuza will store grain in *ottos* rather in the large *batsa*.

Ceramic Life-cycle

Primary-use

There are differences among the caste groups concerning their primary-use of vessels. Differences do occur among the highest caste, the *mala*, in the three villages with regard to the frequency and use of primary-use vessels. The *mala* in the three villages use many of the forms available and cook a variety of foods. The vessel types that the *mala* purchase and use are influenced by a complexity of factors. The *mala* distributions in each village parallel what was discussed above in the primary-use section in each village. Thus, the ecological zone of the village affects the types of vessels that each *mala* group uses. The Zuza *mala* own more *jebanas* (coffee pitchers), *baches* (baking plates), and *distes* (cooking pots) because of their close association with coffee, maize, and cooking stews. In addition, the Zuza *mala* use more wooden serving bowls than *sheles* (serving bowls) and *peeles* (serving dishes), compared to *mala* households in Etello and Guyla.

The *degala* caste is the lowest caste in the social hierarchy in Gamo society, but there is variation in the frequency and types of ceramic vessels that *degala* households own. The *degala* households in Etello own only a few vessels types and so among the three households there are no *jebanas* (coffee pitchers), *sheles* (serving bowls) or *peeles* (serving dishes), *baches* (baking plates), *tsuas* (drinking jars), or

*batsa*s (storage jars). In addition, the restricted ceramic assemblages among the Etello *degala* households clearly demonstrates their lower social status in Gamo society.

Comparing the three castes to each other provides evidence concerning how social status reflects the differences in the household ceramic assemblages. Considerable differences occur between the Zuza *mala* and *mana* households in their use of different vessel types for household food processing. Within the cooking category the largest difference is that 100 percent of the cooking *otto*s used among the *mala* households function for cooking compared to only 40 percent for the *mana* households. The Zuza *mana* used their *otto*s for pottery production and storing wheat flour. Storage is restricted to only two types among the *mana* households compared to seven different types used to store food and water by the Zuza *mala*. The *mala* and *mana* households use the same type of vessels to transport food and water but differ in their reliance. The *mala* households use the water carrying *otto*s more for transporting, but the *mana* use a higher percentage of *tsaro*s, which are smaller for transporting water. Both the *mala* and *mana* households have an average of 4.3 people per household, so household population does not provide a reason for the difference in the vessel type to transport water. The reason the *mana* have more *tsaros* than the *mala* is because a common chore for the *mana* children is to work for their mothers carrying water frequently for pottery production. It is easier for children to carry smaller vessels to transport water, and thus *mana* households have more *tsaros* than *ottos*.

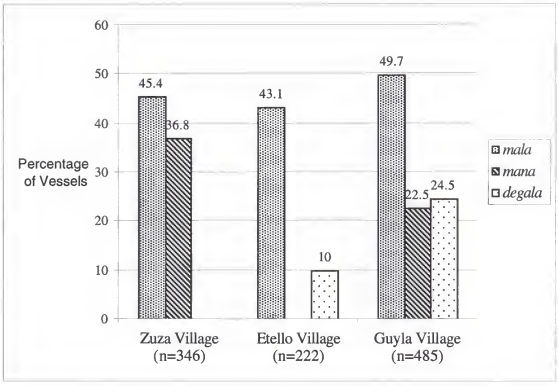

Figure 5-3: Percentage of vessels used for the processing of high cost foods by village caste.

The *mala* have a more diversified household ceramic assemblage than the *degala* households in Etello. The Etello *degala* own only *diste*s (cooking pots), *otto*s (cooking/transporting/storage jars), *tsaro*s (small cooking jars), and one *shele* (serving bowls) for the primary-use stage. The *degala* have one *tsaro* to transport and store water and all the other pots only are used for cooking. This is the most drastic intravillage difference concerning the primary-use of pots found between castes in the three villages. Again the restricted use of the household ceramic assemblage firmly demonstrates the poverty of some *degala* households in Gamo society. This is in

contrast to the *degala* in Guyla who own a variety of types including *batsa*s (large storage jars), which three-fourths of these *batsa*s are used to cook *farso* (beer).

Among the different caste households living in Guyla, there are interesting similarities and differences between the use of specific vessel types among castes. Vessels primarily used for cooking such as *diste*s, *otto*s, and *tsaro*s do not vary among the Guyla caste households. The only dramatic difference is that the *degala* households use half of their large jars (*batsas*) for cooking *farso* (beer), while none of the *mana* and only 20 percent of the *mala* households use them for this function. The *mala* and *mana* in Guyla use more *ottos* for cooking beer than the *degala*. There are no drastic differences among the caste households concerning the percentage of serving conducted with specific types. The three castes use *peele*, *shele*, and *tsua* as serving vessels. Both the *mana* and *degala* households use the same types for storing water. The *mala* households use two more types for storing, although the difference in percentages is not large with only 16.7 percent for *diste*s and 5.5 percent for *peele*s. The *mana* households use only *tsaro*s for transporting water, whereas both the *mala* and *degala* households use more types for transporting water and foods.

Reuse

I expected that the *mana* and *degala* households would reuse more of their broken vessels than *mala* households for two reasons: 1) to reuse vessels for the production of ceramic vessels; and 2) to reuse their vessels because of their lower socio-economic status in Gamo society. In all villages 90.5 percent of the *mala* households mend and reuse their vessels compared to only 9.5 percent for the *mana* and 0.0 percent for the *degala*. Only in Zuza do the *mana* households reuse a higher

percentage of their broken pots (84.6 percent) than do the *mala* households (70.4 percent).

The Guyla *mala* reuse the highest percentage of their vessels (84 percent) compared to 70.4 percent and 57.5 percent for the Zuza and Etello *mala* households, respectively. Although Etello has no potters living in the village, the Etello *mala* reuse fewer pots than the Zuza or Guyla *mala*, where potters live within each village.

The Zuza *mana* households reuse a slightly higher percentage of their pots (84.6 percent) compared to the percentage of pots reused in Guyla *mana* households (76.9 percent). In Guyla, the *mana* households mended only two vessels.

The Etello *degala* reuse 50 percent of their vessels compared to the 80 percent reused by the Guyla *degala* households. The lower percentage of reuse is due to the Etello *degala* households using their vessels predominantly for cooking. Generally, once a vessel is broken by the cooking process, it cannot be used again for additional cooking needs and the *degala* in Etello have no farmland resulting in the lack of a storage need. Therefore, the majority of Etello *degala* households discard their cooking vessels instead of attempting to reuse them for storage. Surprisingly, the Etello *degala* reuse 100 percent of their *distes*, which otherwise has the lowest reuse percentage for all types among the three villages. The *degala* households from Etello and Guyla reflect two different patterns. The Guyla *degala* reuse their vessels almost at the same percentage as the Guyla *mala* households. The Guyla *degala* have farmland and so these households need broken vessels to store their excess crops. Furthermore, farmland provides the Guyla *degala* more economic opportunities than other *degala* households (i.e., Etello *degala* households).

Discard

The *mala* caste households discard a higher percentage of their vessels than either the *mana* or *degala* castes. Guyla *mala* households discard a smaller percentage of vessels than either the Zuza or Etello *mala*. The livelihoods of many Zuza *mala* households are dependent upon weaving (52.9 percent) and so storing excess amounts of crops in large vessels is not as common as among the Guyla *mala* households. In addition, widows occupy a large percentage (47 percent) of the Zuza *mala* households and so farming is not an economic option, making discard more common than reuse of broken vessels for storage. The Etello *mala* have more discarded vessels (41.2 percent) than the two other villages. The Etello *mala* households discard a larger percentage of their *batsa*s than the Zuza and Guyla *mala*. As discussed above, it is surprising that a village without potters would discard a higher percentage of their ceramic vessels, than villages that have potters and therefore an easier access to new pots.

The *mana* households in both Zuza and Guyla discard only 15.4 percent and 23.1 percent of their vessels, respectively. The Zuza *mana* discards only *diste* and *tsaro*, but the Guyla *mana* discards six different types of vessels (i.e., *diste*, *tsaro*, *shele*, *bache*, *batsa*, and *peele*). In addition, only 34.2 percent of the Zuza *mana* pots are broken in their household assemblage, compared to the 54.9 percent of broken pots in the Guyla *mana* household assemblage. The reason the Guyla potters have a higher number of types and discard rate is because they manufacture more types and when those types break during production they keep these vessels for possible future use.

The Etello *degala* have half of their broken vessels in discard compared to only 15 percent vessel discard for the Guyla *degala*. Although the Etello *degala* have 35 percent more vessels in discard than the Guyla *degala*, they only have three vessel types in the broken life-cycle stage compared to six types among the Guyla *degala*. Furthermore, 60 percent of the Etello *degala* vessel assemblage is in the broken life-cycle stage, compared to only 37.7 percent for the Guyla *degala* assemblage. Finally, the Etello *degala* primarily use their vessels for cooking, which is an important component to their high discard rate. Cooking vessels will usually crack on the base when they break and therefore they cannot be used to store liquids such as water or beer, but only dry goods. Since the Etello *degala* do not have farmland they do not have the need to store a seasonal harvest and therefore they discard their vessels rather than reuse them for crop storage.

Artisan castes have limited use of farmland, which influences the foods they eat and their use of pots, especially during the reuse stage. However, households belonging to the same caste, but residing in different villages also may have different opportunities that affect their household assemblage. The analysis of household economic wealth and its association with household ceramics below provides an economic context concerning how wealth influences household ceramic use and discard.

Economic Rank

As with analysis of ceramics in caste households, the economic context will refine the association between household wealth and household ceramic assemblages.

I expect that variation in household wealth influences the frequency, spatial use, and discard of household ceramics and their diet. Because the number of households in each economic rank is small in each village, the frequency of vessels, types, and the percentage of vessels used for processing high-cost foods are not significant. However, the general pattern throughout indicates that household ceramics can suggest differences in wealth given a larger population.

Frequency of Vessels

The frequency of vessels in terms of economic ranked households in Gamo indicates that the mean number of vessels is a strong indicator of economic wealth (Figure 5-4).

In Zuza, the highest ranked households have a mean of 23.4 mean vessels, while the middle ranked households have a mean of 15.7 vessels and the lowest ranked households have a mean of 14.9 vessels. Etello households cluster together with a 12.8 mean in the highest ranked households, 11.7 mean in the second rank, and 7.2 mean in the lowest ranked households. In Guyla, the households are ranked only in two categories, with the highest ranked households having a mean of 30.3 number of vessels and the second ranked households having a mean of 21.4 number of vessels. The mean frequency of vessels indicates a strong correlation with household wealth. Although there is not a significant difference because of the large variation of household vessel frequency, the general pattern suggests that household ceramic frequency in association with the household economic context may aid in the interpretation of household wealth.

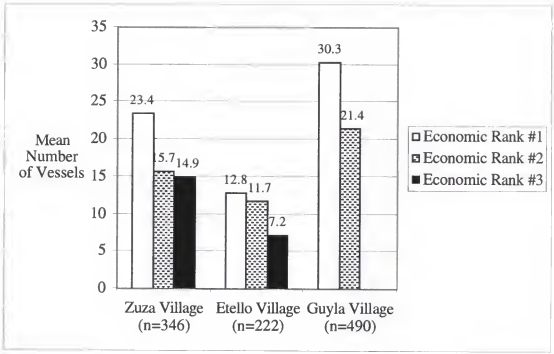

Figure 5-4: Mean number of vessels by economic rank and villages (see Appendix B for summary statistics).

Ceramic Types

There is a larger disparity of vessel types among the different economic ranks, than among caste households, especially in the villages of Etello and Guyla. The lower economic ranked households have fewer ceramic types in Etello. The second-ranked households have fewer types than do the first economic rank in all three villages (Figure 5-5).

Guyla is the wealthiest village with seven first rank households and Etello and Zuza each have five wealthy households. Guyla's wealthiest households have a higher percentage of *tsaros* (small cooking jars), *tsuas* (serving jars), and *peeles* (serving

dishes) than Etello or Zuza's wealthiest households. Poorer households tend to use enset leaves for serving food, rather than ceramic bowls or dishes. *Gumgay*s (washing bowls) and *tayches* (cooking and serving jars) vessel type are found only in these Guyla households. Guyla's wealthiest households purchase a majority of their pots from Guyla's potters. The *tsaro*s in Guyla's wealthy households functions as an all-purpose pot, with these households favoring it for transporting water during the primary-use stage and then reusing it to store crops. *Tsua*s in Guyla are an important jar form for drinking water, milk, and *farso* (beer) compared to the other villages, which rely more on gourds for drinking. Etello's wealthiest households only have a higher percentage of *shele*s (serving bowls) and *guya*s (water pipes) in their household ceramic assemblages compared to the other two villages. Although Etello has a higher percentage of *shele*s (serving bowls) than the other two village's wealthy households, their use is more restricted than Guyla's *shele* use. Zuza's wealthiest households have a higher percentage of *jebana*s (coffee pitchers), *diste*s (cooking pots), *otto*s (cooking/transporting/storage jars), *bache*s (baking plates), and *batsa*s (storage jars) than found in Etello or Guyla's wealthiest households. The high percentage of *jebana*s (coffee pitchers) reflects the ecological setting of Zuza because coffee is commonly grown by its wealthy households. The only surprise is the high frequency of *batsa*s (storage jar) in Zuza's first-ranked households. As indicated earlier, Guyla has more wealthy households and, in general, Guyla owns more *batsas*. However, there are two *Halaka* households in Zuza that specialize in the manufacturing of *farso* (beer) and so I believe these households have skewed the percentage of *batsa*s among Zuza's

wealthiest households. These two Zuza *Halaka* households' own eleven *batsas* and the other three wealthiest households in Zuza only own four *batsas*.

The second-ranked households in Zuza, Etello, and Guyla are similar to the first ranked-households discussed above. Two differences occur between the three village's second-ranked households with the first being a higher percentage of *batsa*s in Guyla's second-rank households than that found in Zuza or Etello's second-ranked households. This is expected and further strengthens the conclusion that one Zuza *Halaka* household skewed the expectation that a higher percentage of *batsa*s (storage jars) should be found in Guyla households. The other difference is that a higher percentage of *guya*s (water pipes) is found in Guyla's second-ranked households compared to the percentages of *guya*s found in Zuza or Etello. This is not surprising, as smoking tobacco in Guyla is a popular past time among people from different households. In addition, work parties will take time to rest during the day and will smoke together in the field or at someone's household.

The third- or poorest ranked households in Etello have fewer vessel types (4.2 vessel types) than the average number of vessel types found in Zuza's poorest households (6.5 vessel types). Zuza's poorest households have higher percentages of *jebana*s (9.3 percent), *diste*s (12.7 percent), *shele*s (10.2 percent), *bache*s (7.6 percent), *tsua* (6.8 percent), and *batsa*s (5.9 percent) compared to the Etello's poorest households. Etello's poorest households own more *otto*s (41.4 percent), *tsaro*s (27.6 percent), and *guya*s (6.9 percent) compared to the Zuza's poorest households. The differences between the two groups of households reflect their social context. Three-fourths of Etello's poorest households are hide-workers, who have no land to farm.

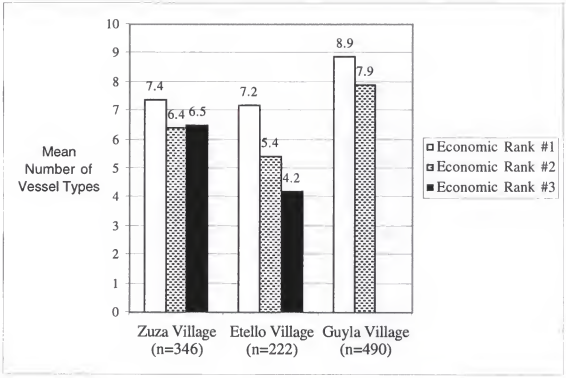

Figure 5-5: Mean number of vessel types by economic rank and villages. (see Appendix B for summary statistics).

Zuza's poorest households are all widows that belong to a high social status (*mala*). The severe poverty of Etello's poorest households forces them to prioritize the types they use, which are predominantly cooking vessels (i.e., *otto*s and *tsaros*). Zuza's poorest rank households consist of widows that either spin cotton or manufacture pots for their economic livelihood. Zuza's poorest households can either sell enough spun cotton to weavers to purchase a more diversified ceramic assemblage and the potters can produce their own wares.

In Zuza, dramatic variations in vessel types occur between the poorest households and the wealthier Zuza households in regards to their use of cooking jars (*tsaros* and *ottos*) and storage and beer fermentation jars (*batsas*). Zuza's poorest

households use and own more *tsaros* than do the wealthier households, which use and own more *ottos*. The most common uses of *tsaros* among the poorest households are to boil coffee leaves, cook *kashca* (i.e., known as *enchila* in the Gamo highland area) (see Chapter 2 for a description of Gamo foods), and boil cabbage. Drinking the water from boiled coffee leaves and eating *kashca* and boiled cabbage represents poverty among Zuza's households. Widows inhabit the majority of Zuza's poorest households, therefore; they do not need large cooking jars (*ottos*). Zuza's wealthier households are using *ottos* for more of their cooking and to ferment, transport, and sell beer (*farso*) than do the other two lower economic ranks. Zuza's wealthiest households own more *batsas* and use them more for storing and fermenting beer. Since the production of beer requires a large amount of grain there is a strong relationship between the production of beer (*farso*) and wealth in Gamo society, which is clearly demonstrated among Zuza's different economic households. Beer production seems to influence the use of drinking vessels, as Zuza's wealthiest households use fewer *tsuas* that primarily function as drinking cups compared to the other rank households. The reason why the first rank households have fewer *tsuas* is they use gourds rather than *tsuas* for drinking beer. The first economic rank has 12.2 gourds per household compared to only 3.6 and 5.1 gourds for the second and third rank households, respectively.

In Guyla, the two (economic ranked) households are more similar to one another than the Zuza and Etello's (economic ranked) households. The only differences occur among the *baches* (baking plates) and *peeles* (serving dishes). Only one first-ranked household owns a *bache*, compared to seven second-ranked households, which own nine *baches*. The first-ranked households tend to use their

cooking *ottos*, in lieu of purchasing and using *baches*. There is no clear explanation as to why these two economic ranks differ in their use of *baches*. Both ranked households use *peeles* for serving but the wealthier households use their *peeles* for a larger variety of foods than does the second rank Guyla households. The use of *peeles* is an indication that the first-ranked households have a more diversified diet than do the second-ranked households.

In Etello, among the different ranked households there are drastic differences between their households, with only *distes* (cooking pots) and *baches* (baking plates) as having a similar percentage of use. The third-ranked has a higher percentage of *ottos* and *tsaros*. Whereas, the first- and second-ranked households have a higher percentage of *sheles* (serving bowls), *peeles* (serving dishes), *tsuas* (serving jars), and *batsas* (storage and beer fermentation jars). The reason there are a large percentage of *ottos* and *tsaros* among the third-ranked is due to the large amount of cooking with these two types. Etello's poorest households use only the necessary vessel types, which are predominantly those for cooking. In addition, the four households among the poorest economic rank use only two *sheles* and no *peeles* for serving. In addition, one household uses a metal serving dish for serving. As expected, the poorest economic rank does not use *batsas*, which the wealthier households own. Three of the Etello's poorest households are situated next to each other. Therefore, the low use of *tsuas* among the poorest households is possibly the result of one household using plastic cups for drinking and then sharing with the other two households. The contrast between the third-ranked households and the first- and second-ranked households is

due to the extreme poverty of Etello's poorest households, who use a restricted ceramic assemblage, predominantly for cooking vessels.

Since the wealthier households have more economic opportunities, it is expected that they would use a higher percentage of ceramic vessels to process expensive food than would the lower economic rank households (Figure 5-6). The percentage of ceramic vessels that are used to process high-cost foods are higher among the first- and second-ranked households in both Zuza and Etello villages compared to the third-ranked households. In addition, in the village of Guyla, the percentage of vessels is higher among the first-ranked households than among the second-ranked households. Wealthier households have more diversified ceramic vessel assemblages. In addition to having a more diverse vessel assemblage, wealthier households use their pots to cook, serve, store, and transport more diverse and expensive types of foods than poorer Gamo households.

Ceramic Life-cycle

Primary-use

The expectation is that primary-use vessels reflect a household's economic wealth because certain vessel types are directly associated with specific types of foods. Among Gamo's wealthiest households, there are differences and similarities concerning how they use their primary-use vessels. Some of these differences reflect the village's ecological setting, as Zuza's wealthier households own more *distes* (cooking pots) and *baches* (baking plates) than do Etello or Guyla's first-ranked households. As stated before, Zuza's households cook more stews, which are

traditionally cooked in *distes*, and use their *baches* for roasting and cooking maize bread more than the other two villages. The similarities among Gamo's wealthiest households indicate that their primary-use of vessels reflects both their diet and their wealth. For instance, the wealthiest households within each village rely more on their *ottos* and *batsas* for the production of beer than the poorer households do, which is an indicator of wealth in Gamo society. The wealthiest households among the three villages studied use an average of 1.5 *batsas* and 2.4 *ottos* per household for processing beer during their primary-use stage. This compares to only an average of 1.1 and 0.1 *batsas* per household among the second- and third-ranked households, respectively. In addition, the second- and third-ranked households only use an average of 1.2 and 0.5 *ottos* per household for beer production during their primary-use stage.

As with the ceramic differences between the caste households, wealth differences between households may affect how vessels are used and discarded. There are no dramatic differences in the percentages of cooking vessels among Zuza households of different rank. Serving vessels among Zuza's ranked households do indicate differences, however. The lowest rank households serve only with *sheles*. The second-ranked households only use *shele* and *tsuas* for serving, whereas the wealthiest households in Zuza use a combination of *peeles*, *sheles*, and *tsuas* for serving. Storage among the three ranks is generally similar in the types and percentages used for storing water and foods. The wealthiest households have a higher percentage of *tsaros*, which function for transporting, than do the other two lower economic ranks.

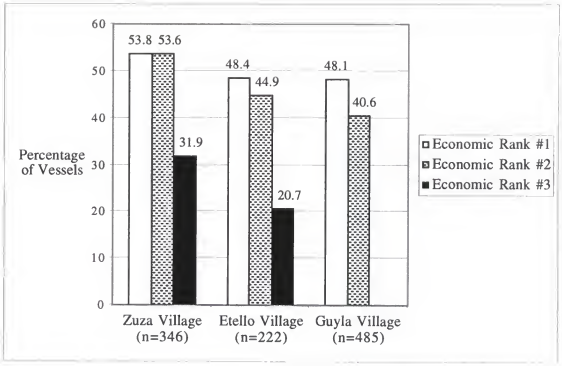

Figure 5-6: Percentage of vessels used for the processing of high cost foods by economic rank and villages.

Households in Etello parallel the differences among the caste households, as three of four of the poorest households belong to the *degala* caste. Therefore, the functions among the different vessel types are more restricted, compared to the second- and first-ranked households. The number of vessels used for serving, storage, and transporting is less frequent among the poorer rank households than among the wealthier households.

The Guyla households reflect only slight differences concerning how people use multiple functional vessels across ranks. Cooking *ottos* are used for generally the same functions for wealthy and poor households except there is more storing conducted with this type of pot among the wealthiest households. The second-ranked

households use their smaller cooking pot (i.e., *tsaro*) to cook more frequently cabbage and potato than do the wealthiest households. The first and second economic ranks use all their other vessel types similarly to one another.

Reuse

Differential reuse of vessels among economic ranks is only evident in Etello. In Zuza, the different ranks cluster together in their percentage of reuse of broken pots, with the wealthiest households reusing 62.8 percent, the second-rank reusing 63.8 percent, and the poorest households reusing 66.7 percent of their broken pots. Guyla's two ranks also cluster together with the wealthiest households reusing 86.4 percent and the second-ranked households reusing 80.5 percent of their broken pots. Etello has the largest disparity between its economic ranks among the three villages, with the wealthiest households reusing 71.4 percent, the second-ranked households reusing 59.2 percent, and the poorest households reusing only 57.1 percent of the broken pots. The low percentage for Etello's poorest households is due to their use of only a few types that function for cooking, and their lack of farmland. Thus, the cooking pots are difficult to reuse if they break irreparably from cooking activities and the lack of farmland means there is little need for storing excess crops. There is a higher reuse among the wealthiest households because they farm and need storage vessels.

Discard

Comparing the economic ranks within each village, there are no large differences concerning discard patterns. However, differences in discard occur among the three ranks in Etello, with the wealthiest households discarding fewer vessels

compared to the second- or third-ranked households. These differences parallel the circumstances discussed earlier concerning Etello's reuse patterns found among the different economic ranks. Etello's wealthier households have larger harvests and therefore discard fewer large broken storage jars than do the poorer second and third economic ranks.

Similar discard percentages occur among Zuza and Etello's first-ranked households with 37.2 and 38.1, respectively. Guyla's wealthiest households discard only 13.6 percent of their vessels, suggesting they have a larger harvest and more demand for reused vessels than do either Zuza or Etello's wealthier households.

All three villages have different discard percentages among their second-ranked households, with Guyla having the least and Etello discarding almost half of all broken vessels. As mentioned in the above, Etello's second-ranked households are discarding a higher percentage of their large *batsa* jars than do those of either Zuza or Guyla. Comparisons are tenuous as Zuza's second-ranked households only have two *batsa*s among all its households. The reuse of *batsa*s is predominantly for storage, suggesting that the amount of crops harvested among the Etello's second-ranked households is not as much as in Guyla.

Zuza and Etello's poorest rank households have different discard percentages with 33.3 percent and 50 percent, respectively. Three-fourths of Etello's poorest households consist of *degala* households with no land to farm. Therefore, it is not surprising that these households do not have the capital to purchase large, expensive storage jars for processing beer during primary-use or the need to store crops during the reuse cycle.

This analysis suggests that household economic wealth influences the types and use of ceramic vessels. The wealthier economic ranks in all three villages have a more diversified assemblages, own more vessels, use larger vessels, and use a higher percentage of their household assemblage to process expensive foods and reuse large vessels more often than do the poorer households.

Summary and Conclusions

The switch from ceramic vessels to industrial containers among societies around the world has provided researchers an avenue to explore how technological change affects household material culture (Sargent and Friedel 1986; Skibo 1994). The technological change from ceramic to industrial containers in Gamo society is beginning, but presently industrial vessels are not as important to the processing of foods as ceramic vessels. The Gamo still cook, serve, and store foods with mostly ceramic vessels. The use of plastic water containers is beginning to impact how people transport their daily water, especially in villages located near large towns. Plastic containers do not break as easily and ceramic transporting jars have a short use-life (see Chapter 7) because people tend to drop their vessels when they slip and fall on the wet and slick footpaths, making plastic containers more popular. However, a 50 liter plastic container costs approximately 25 birr (U.S. $3.0), whereas the average cost of a large ceramic jar (i.e., *otto*) costs only 3.36 birr (U.S. $0.50). Etello located near a large town has the highest use of industrial types, while Guyla has a more rural location and is less impacted by industrial containers. The only ceramic type in Gamo which potters do not manufacture because of the influx of an industrial container is the

small coffee cup (i.e., *sene*). Gamo households, as well as most of Ethiopia, now use the Chinese manufactured porcelain cup to drink coffee.

Variations in ceramic use among the Gamo indicate that archaeologists interested in accounting for ceramic variation may find explanations through differences in use resulting from variations in village environment, diet, and socioeconomic status. Some relevant factors affecting Gamo environmental setting and socioeconomic status, and demand and use of specific vessel types include: (1) potential for crop production; (2) proximity to water sources; (3) household social status; (4) household economic wealth; and (5) social interaction between ceramic consuming and producing households. Ecological conditions allow Zuza households to use more wooden serving vessels than do either Etello or Guyla, because Zuza is located in a less densely inhabited region where there are abundant trees for producing serving vessels. However, in Guyla and Etello where the land is densely occupied, there are only localized forests, which are protected from cutting. Villages located in specific ecological zones affect the types of crops that people grow, which, in turn, influences their use of particular ceramic types. Coffee, an expensive crop to purchase, is grown in Zuza's household gardens and so Zuza households have a higher frequency of *jebana* coffeepots than do those of Etello or Guyla, where coffee does not grow because of the high altitude. In addition, Zuza's water sources are farther and more difficult to travel to, which encourages Zuza households to acquire and use more water transport vessels than Etello and Guyla households.

A direct association occurs among the types of foods consumers produce and eat and the vessel types that potters specialize in reflecting onto the village and

household assemblages. In addition, where both potters and consumers sell and purchase their pots affects which types are found in particular villages and households. Because Zuza and Ochollo farmers grow maize and teff, Zuza consumers cook more *enjera* and Zuza potters manufacture more *baches* than do Etello or Guyla households. Zuza consumers cook more stews (*wat*) in *distes*, and thus Zuza potters manufacture this type of cooking pot more than do Guyla potters. In contrast, Etello and Guyla households have a higher frequency of *sheles*, *tsuas*, and *guyas* than do Zuza households. Guyla consumers prefer *peeles* (serving dishes) more than Zuza and Etello consumers do and hence Guyla potters specialize in the manufacturing of *peeles*. Therefore, the consumer's demand for specific types partly determines the vessel types that potters manufacture.

The process of mending vessels for further use after they have cracked occurs throughout Gamo households, but is most common in the non-potter village of Etello. Etello, as expected due to its lack of potters, has the highest percentage of mended pots (12.3 percent) which is far greater than the 4 percent and 1.3 percent of mended pots for Zuza and Guyla, respectively. Senior (1995:97-98) found in her analysis of Mexican Rarámuri pots that large vessels were most often mended. Similarly among the Gamo, large vessels such as the *otto* and *batsa* are the most common types of vessels that Gamo households repair. These two types of Gamo vessel types are most commonly used after they are mended for the storing of surplus agricultural crops. Therefore, the presence of mending in an archaeological assemblage may suggest that potters do not live within the village or surrounding area. Furthermore, mending of

specific types of pots may indicate particular economic activities such as the storage of surplus crops.

Archaeological ceramics also may provide clues in the interpretation of household social status. Previous ethnoarchaeological research indicates that there are a variety of associations between household ceramic assemblages and social status (Deal 1998; Miller 1985). Deal's (1998:102-107, 168) ethnoarchaeological study of two Mayan communities reveals a strong association between pottery diversity and social status. The strongest association occurred between social rank and diversity of ritual types rather than domestic types (Deal 1998:102-107). Miller's (1985:73) ethnoarchaeological study among 63 households in the village of Dangwara of Central India concluded that there was not an association between caste hierarchy and household frequency of pots or with specific types of water vessels. In addition, high castes have a higher frequency of metal vessels compared to the lower caste households. The study also found that caste hierarchy is related to specific types of cooking vessels based on color, indicating that cooking vessels transmit social power (Miller 1985:773-74, 142-160). The Gamo analyses between caste hierarchy and household ceramics found strong associations between the average frequency of household pots and the function of vessels with social status. However, there is a weak relationship between the average number of vessel types and caste hierarchy, with Etello providing the only strong association between the two.

Ethnoarchaeological studies dealing with household wealth have indicated both positive and negative associations between ceramic frequency and type with wealth. Deal's (1998:101-107, 168) ethnoarchaeological research among the Maya did

not find a strong association between pottery diversity and economic wealth. Only when industrial types were included with the ceramic types did economic wealth become associated with ceramic diversity (Deal 1998:168). Trostel (1994:222-223) found that the average number of pots (i.e., both ceramic and metal) per household was not a strong indicator of wealth. By contrast, Miller's (1985:73-74) study of wealth in India found a strong association between the number of metal vessels with household economic wealth, with the wealthier households having a higher frequency of metal pots than the poorer households. The study concerning Indian wealth demonstrates that wealthier families have a more diverse diet and eat more often than do poorer households (Miller 1985:74). Concerning the correlation between household possessions and wealth, Smith (1987) hypothesizes that in an agrarian society, wealthier households would have a higher frequency of vessels, more serving vessels, and use vessels for the processing of more elite items, than would poorer households. The analysis of Gamo households indicates that the frequency and function of vessels used are strong indicators of economic wealth. The diversity of vessel types correlates more strongly with Gamo household economic wealth than with social status. Wealthier households in Gamo have more serving vessels than poorer households, corroborating to Smith's (1987) findings. Beer production is associated more with wealthy households because of the large amount of grain involved. Wealthier households in Gamo use more of their *batsas* and *ottos* for beer production. In addition, during the primary-use stage, the large storage jars (*batsas*) are used to ferment the beer, which is the most expensive vessel type in the Gamo assemblage (see Chapter 4).

Archaeologists should not assume that once a vessel is broken that it is discarded and never reused (Deal 1998; Deal and Hagstrum 1995; Stanislawski 1969, 1978). This study duplicates results from other studies, namely that the reuse of vessels is a common occurrence (Deal 1998:168). Deal's (1998) ethnoarchaeological study conducted among the Maya indicates that reused vessels made up on average 21 percent of the household inventories, whereas 32.9 percent of the Gamo household assemblages have broken reuse pots.

This chapter provides archaeologists with a contextual perspective concerning the different ceramic life-cycle stages. The use, reuse, and discard of ceramic vessels have definitive household activities concerning how people use their assemblages. For example, the reuse stage of a household's assemblage is as important as its primary stage in providing the household's food processing needs. The life-cycle stages may also reflect a household's social and economic status, providing the archaeologists with a more complete picture of the societies social organization and interaction.

CHAPTER 6
DISTINGUISHING THE CERAMIC LIFE-CYCLE THROUGH SPATIAL AND USE-ALTERATION ANALYSES

Spatial and use-alteration studies provide two different types of analyses for interpreting the different stages of a vessel's life-cycle. The spatial location of ceramic vessels can leave information concerning human behavior and help address archaeological formation processes (Deal 1998; Schiffer 1972, 1983, 1987). The goals of my household spatial analysis are to contribute to a more refined interpretation of the ceramic life-cycle and its association to differences and similarities within the village, social, and economic context. In conjunction with the spatial analysis, the use-alteration analysis further details the stages of the ceramic life-cycle. The use of a pottery vessel leaves markers on the ceramic wall that can inform the archaeologist how the vessel functioned in the past. Ethnoarchaeological studies of ceramic use have proven vital for revealing specific use-alteration patterns, such as carbon deposits and surface abrasions on ceramic vessels, which represent specific types of food processing (Kobayashi 1994; Skibo 1992).

The spatial location of a pot is dependent upon its life-cycle stage, as well as the village's location and the household's social status and economic wealth. The use alteration analysis distinguished the association of specific vessel forms with specific functions, which in turn relate to the socioeconomic position of the user. Therefore,

these two types of analyses further distinguish the signatures of the ceramic life-cycle, aiding archaeologists in their interpretation of household ceramics.

Household Storage Areas

The layout of Gamo households varies depending on the region, social status, and economic wealth of the household. A wealthy household has several buildings that serve as the main house, kitchen, and storage. This is especially true for the villages of Etello and Guyla. However, the village of Zuza is located on top of a narrow ridge causing a shortage of land for the households. Therefore, Zuza households usually only consist of one house, where all daily activities take place.

The interior of a wealthy house is broken into different sections. Vestibules are common in Etello and Guyla, but they are not built in Zuza. Usually two benches are placed on either side of the vestibule, where people can sit and sleep. Pots are stored sometimes underneath these benches. The central portion of the house is constructed for the hearth and the main gathering area. Benches and beds are placed along the central area with bamboo walls separating this section from the partitioned areas for storage and keeping livestock. A wooden rack is constructed over the bamboo walls, where people keep large storage vessels. Other vessels are kept underneath the beds and benches, and in the storage rooms, while serving vessels are hung from the bamboo walls for easy access. However, the majority of vessel types are informally stored in a variety of household areas including well-defined storage areas. In addition, people stack smaller vessels on top of larger ones for lids and to have more floor area for other activities.

Poorer households have one structure containing only a bed and a few wooden chairs, such houses are found among the Zuza *mana* and the Etello *degala*. *Mana* houses have wooden racks built over the hearth where they dry newly constructed vessels. The use of space throughout the different life-cycle stages should aid archaeologists in their interpretation of activity areas and socioeconomic variation.

The Village and the Spatial Analysis of Household Ceramics

Primary-use

The spatial location of vessels is largely dependent upon where the vessels are in terms of their life-cycle. In all three villages, households store a majority of their primary-use pots in clusters of two or more (see Table 6-1). All villages keep the majority of their primary-use vessels stored in association with other vessels within the main house. The second most common place to store primary-use vessels is in the kitchen, where people store them in clusters, adjacent to the wall or surrounding the hearth.

Primary-use pots also are stored in clusters in the compound, adjacent to the house, and inside either the store or weaving houses. Individual primary-use pots also are stored in the compound, garden, and either adjacent to the house or to the kitchen. Only ten (16.7 percent) of the 60 households studied kept some of their primary-use vessels either adjacent to the house or kitchen. In addition, only six (10 percent) of the sixty households studied kept primary-use pots either in the garden and compound, and five of these six houses store primary-use pots by themselves.

Table 6-1: Percentage of village households and the location of vessels stored during primary-use.

Village	Zuza	Etello	Guyla	Zuza	Etello	Guyla
Storage Types	Single Vessel	Single Vessel	Single Vessel	2 or More Vessels	Two or More Vessels	Two or More Vessels
House	10 %	25 %		85 %	75 %	100 %
Kitchen	10 %	5 %	20 %	25 %	40 %	45 %
Adjacent to House	5 %	-	20 %	15 %	-	
Compound	5 %	10 %	5 %	5 %	-	10 %
Garden	5 %	-		-	-	-
Adjacent to Kitchen	-	-	10 %	-	-	-
Store House	-	5 %	5 %	-	5 %	5 %
Weaving House	-	-	-	-	-	10 %

Reuse

The village spatial analysis demonstrates that after pots break, Gamo people begin to gradually shift their storage location from inside the house or kitchen to storage either adjacent to the kitchen or house (Figures 6-1 and 6-2). However, as with the primary pots, the majority of reuse pots continue to be stored in clusters of two or more within the house or kitchen. The spatial use of household compounds affects where pots will be stored during different stages of their life-cycle (Table 6-2).

During the reuse stage, a larger number of households in both Etello and Guyla store pots individually or in association with each other in their kitchens. Zuza (n = 6) has fewer households with separate kitchen structures, compared to kitchens for Etello (n = 19) and Guyla (n = 20) (Figures 6-1 and 6-2). Zuza's location on top of the Ochollo Ridge restricts the size of household compounds resulting in a fewer number of structures. In Guyla, they store reused pots in a larger number of different

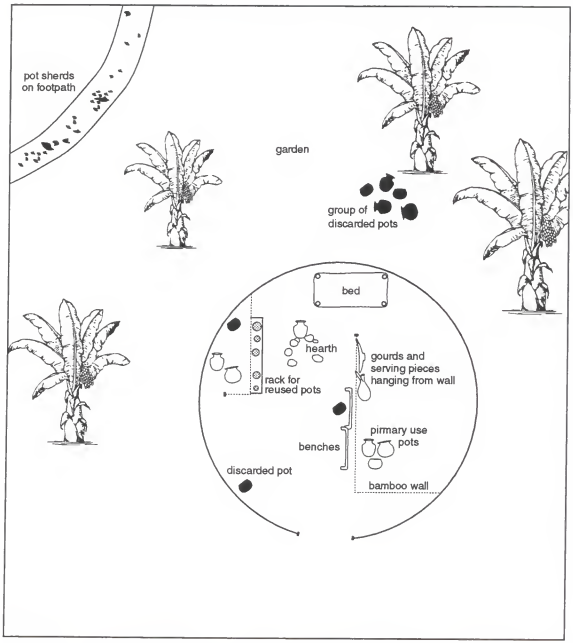

Figure 6-1: Generalized spatial pattern of the different pottery life-cycle stages in the village of Zuza, and the low caste and economic ranked households of Etello and Guyla.

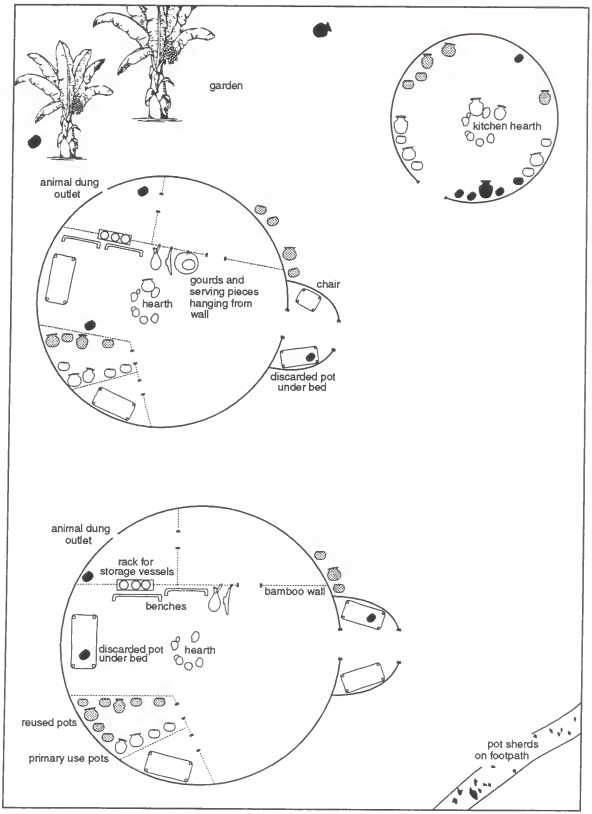

Figure 6-2: Generalized spatial pattern of the different pottery life-cycle stages in the villages of Etello and Guyla, including their high caste and economic ranked households.

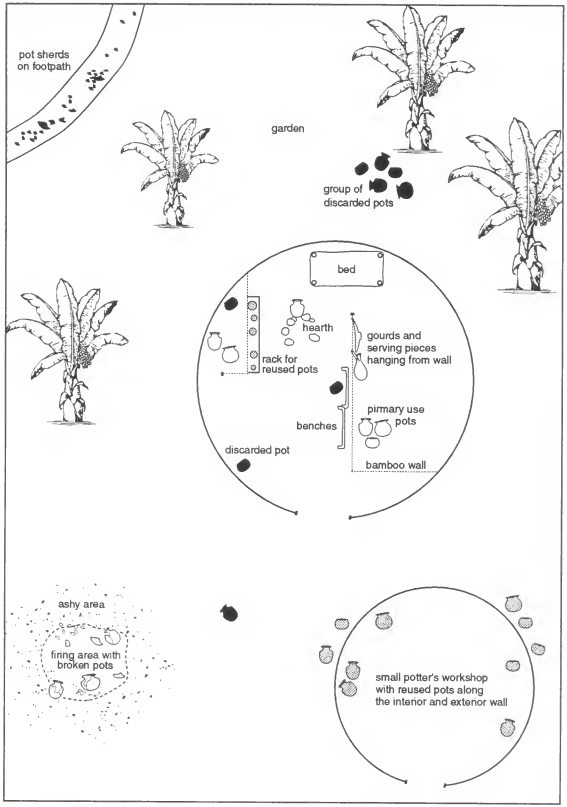

Figure 6-3: Generalized spatial pattern of the different pottery life-cycle stages in the potter households of Guyla.

household areas. For example, a broken reused pot is in storage in an abandoned adjacent house and the storage of vessel clusters occurs in firing areas and adjacent to a workhouse.

Table 6-2: Percentage of village households and the location of vessels stored during reuse.

Village	Zuza	Etello	Guyla	Zuza	Etello	Guyla
Storage Types	Single Vessel	Single Vessel	Single Vessel	Two or More Vessels	Two or More Vessels	Two or More Vessels
House	10 %	25 %	15 %	70 %	35 %	65 %
Kitchen	5 %	30 %	15 %	15 %	20 %	60 %
Adjacent to House	15 %	5 %	10 %	15 %	-	5 %
Compound	10 %	-	5 %	5 %	-	5 %
Garden	5 %	-	10 %	-	-	-
Adjacent to Kitchen	-	5 %	10 %	5 %	5 %	-
Store House	-	-	-	-	10 %	5 %
Weaving House	-	-	-	-	-	10 %
Pottery Firing Area	-	-	-	-	-	5 %
Abandoned Adjacent House	-	-	5 %	-	-	-
Adjacent to Workhouse	-	-	-	-	-	5 %

Discard

Although there is a gradual change in the spatial storage of vessels from their primary-use to broken reuse stage, the spatial location of pots in their discard stage is dramatic compared to the two previous stages. A higher percentage of households store their discarded pots individually in the house and kitchen compared to when the pots were in their primary and reuse stages. Although the pots are in the discard stage

the household may decide to use them to fulfill some function, break and use the sherds, or toss the vessels into the household garden or village footpath. Individual pots also are placed adjacent to the house or weaving house, compound, garden, and inside the store house. In Zuza, more households (40 percent) store their single discarded pots inside their houses, but in Guyla, more households (30 percent) store their single discarded pots inside their kitchens. This is a result of Guyla having 21 kitchens to only six kitchens in Zuza. This is important for archaeologists in deciphering vessel function and activity areas. An equal percentage of Etello households keep their single discarded pots in both their houses (15 percent) and kitchens (15 percent) (see Table 6-3).

The three villages differ concerning where they place their groups of two or more provisionally discarded vessels. The people of Zuza keep a majority of their discarded vessels in their gardens (25 percent), whereas Etello households store groups of discarded vessels inside their kitchens (20 percent), and 15 percent of Guyla households keep their vessels in the kitchen. Discarded vessels that are placed together are also stored inside houses and adjacent to houses and kitchens.

The location of vessels in each of the three villages changes throughout the vessel's life-cycle. During the primary stage, the majority of vessels are stored together in groups of two or more in either the house or kitchen. After vessels break and the people reuse them for a secondary function, a gradual change occurs with people moving pots outside, adjacent to the house and kitchen. In addition, the spatial organization of household compounds in each village has an effect on where reused vessels are stored. Where kitchens are more abundant in Etello and Guyla, households

store broken reused vessels in their kitchens; where kitchens are not common, as in Zuza, kitchen storage is comparatively low. Although there is a gradual change to pots being stored individually, the majority of broken reused pots remain together in clusters of two or more.

Table 6-3: Percentage of village households and the location of vessels stored during discard.

Village	Zuza	Etello	Guyla	Zuza	Etello	Guyla
Discard Types	Single Vessel	Single Vessel	Single Vessel	Two or More Vessels	Two or More Vessels	Two or More Vessels
House	40 %	15 %	20 %	5 %	5 %	10 %
Kitchen	10 %	15 %	30 %	5 %	20 %	15 %
Adjacent to House	10 %	-	10 %	15 %	-	-
Compound	-	10 %	5 %	10 %	5 %	10 %
Garden	10 %	-	5 %	25 %	10 %	-
Adjacent to Kitchen	-	-	-	5 %	5 %	-
Adjacent to Weaving House	5 %	-	-	-	-	-
Store House	-	5 %	-	-	-	-

Archaeologically the study of household ceramic spatial patterning throughout the different life-cycle stages is important to help archaeologists decipher vessel function, household abandonment, activity areas, and the social and economic variation among different households.

Caste Groups and the Spatial Analysis of Household Ceramics

Primary-use

The spatial analysis of caste households indicates that the social status of a household can influence where people place their household ceramics. Caste households parallel the results discussed above concerning the spatial location of pots within each village (Figures 6-1 and 6-2). There is a larger range of household areas where *mala* households put their single vessels of primary-use. These areas include inside the house, kitchen and storehouse, outside in the compound, garden, and adjacent to the house, kitchen, and weaving house. Both *mana* and *degala* artisan caste households have more restricted areas where they store their individual primary-use pots. The artisan households store their single primary-use vessels only inside the house and kitchen and adjacent to the house. The *mana* and *degala* households have smaller plots of land than the *mala* households. All three castes in each village store the majority of their primary-use vessels in clusters inside their houses (see Tables 6-4, 6-5, and 6-6).

Table 6-4: Percentage of Zuza caste households and the location of vessels stored during primary-use.

Caste	*mala*	*mana*	*mala*	*mana*
Storage Types	Single Vessel	Single Vessel	Two or More Vessels	Two or More Vessels
House	11.8 %	-	82.3 %	100 %
Kitchen	11.8 %	-	29.4 %	-
Adjacent to House	15.9 %	-	11.8 %	33.3 %
Compound	5.9 %	-	-	33.3 %
Garden	5.9 %	-	-	-

Table 6-5: Percentage of Etello caste households and the location of vessels stored during primary-use.

Caste	*mala*	*degala*	*mala*	*degala*
Storage Types	Single Vessel	Single Vessel	Two or More Vessels	Two or More Vessels
House	28.6 %	33.3 %	100 %	66.7 %
Kitchen	7.1 %	-	57.1 %	-
Compound	14.3 %	-	-	-
Store House	7.1 %	-	7.1 %	-

Table 6-6: Percentage of Guyla caste households and the location of vessels stored during primary-use.

Caste	*mala*	*mana*	*degala*	*mala*	*mana*	*degala*
Storage Types	Single Vessel	Single Vessel	Single Vessel	Two or More Vessels	Two or More Vessels	Two or More Vessels
House				100 %	100 %	100 %
Kitchen	14.3 %		66.7 %	57.1 %	-	33.3 %
Adjacent to House	21.4 %	33.3 %		-	-	-
Compound	7.1 %			14.3 %	-	-
Adjacent to Kitchen	14.3 %			-	-	-
Store House	7.1 %			7.1 %	-	-
Weaving House				14.3 %	-	-

Reuse

Mala households continue to place their individual reused vessels in more household areas than do either artisan caste households. Except for the Guyla *mana* households, the other artisan households store their single broken vessels in more household areas than they do their single primary-use vessels. The majority of vessels stored in clusters located inside houses, but not to the extent that they were during their primary-use stage. *Degala* households in both Etello and Guyla villages persist in

storing their reused vessels in either their houses or kitchens (see Tables 6-7, 6-8, and 6-9).

Table 6-7: Percentage of Zuza caste households and the location of vessels stored during reuse.

Caste	*mala*	*mana*	*mala*	*mana*
Storage Types	Single Vessel	Single Vessel	Two or More Vessels	Two or More Vessels
Household	11.8 %	-	70.6 %	66.7 %
Kitchen	5.9 %	-	17.6 %	-
Adjacent to House	11.8 %	33.3 %	17.6 %	-
Compound	11.8 %	-	5.9 %	-
Garden	5.9 %	-	-	-
Adjacent to Kitchen	-	-	5.9 %	-

Table 6-8: Percentage of Etello caste households and the location of vessels stored during reuse.

Caste	*mala*	*degala*	*mala*	*degala*
Storage Types	Single Vessel	Single Vessel	Two or More Vessels	Two or More Vessels
House	17.6 %	66.7	35.3 %	33.3 %
Kitchen	35.3 %	-	23.5 %	-
Adjacent to House	5.9 %	-	-	-
Adjacent to Kitchen	5.9 %	-	5.9 %	-
Store House	-	-	11.8 %	-

There are differences in reuse locations between the *mana* households of Zuza and Guyla. The Zuza *mana* use vessels for pottery production that were not accepted as quality vessels to sell to Gamo consumers. The Guyla *mana* use broken household vessels for pottery production. This difference among the types of vessels used for pottery production affects where broken reuse vessels are stored. Two-thirds of the

Zuza *mana* households store their vessels in groups of two or more inside their houses. However, the Guyla *mana* store vessels in clusters of two or more either in the compound, adjacent to the work house or pottery firing area as wind protectors.

Table 6-9: Percentage of Guyla caste households and the location of vessels stored during reuse.

Caste	*mala*	*mana*	*degala*	*mala*	*mana*	*degala*
Storage Types	Single Vessel	Single Vessel	Single Vessel	Two or More Vessels	Two or More Vessels	Two or More Vessels
House	21.4 %	-	-	57.1 %	100 %	66.7 %
Kitchen	7.1 %	33.3 %	33.3 %	71.4 %	-	66.7 %
Adjacent to House	7.1 %	-	33.3 %	-	33.3 %	-
Compound	7.1 %	-	-	-	33.3 %	-
Garden	14.3 %	-	-	-	-	-
Adjacent to Kitchen	7.1 %	-	33.3 %	-	-	-
Store House	-	-	-	7.1 %	-	-
Weaving House	-	-	-	14.3 %	-	-
Store in Pottery Firing Area	-	-	-	-	33.3 %	-
Abandoned adjacent house	7.1 %	-	-	-	-	-
Adjacent to Workhouse	-	-	-	-	33.3 %	-

Discard

Different castes may place their discarded vessels in distinct locations, thereby providing clues in identifying a household's social status. Zuza and Etello *mala* households equally deposit single and grouped vessels in different areas of the household compound. Guyla *mala* households deposit more vessels individually rather than in groups of two or more inside their kitchens and houses. All *mala* households

deposit the majority of their discarded vessels in either their houses or kitchens. However, a large percentage of Zuza *mala* households (29.4 percent) place discarded pots in clusters within their gardens. In addition, Zuza *mala* households store more single and grouped discarded vessels outside in the compound than do either Etello or Guyla *mala* households. This is possibly a result of only 1.5 buildings per Zuza *mala* household, compared to 2.8 and 2.7 buildings per *mala* household for Etello and Guyla, respectively. Thus, Zuza *mala* have fewer buildings and they must place discarded vessels outside either adjacent to buildings or in the garden or compound areas (see Tables 6-10, 6-11, and 6-12).

Table 6-10: Percentage of Zuza caste households and the location of vessels stored during discard.

Caste	*mala*	*mana*	*mala*	*mana*
House	35.3 %	66.7 %	5.9 %	-
Kitchen	11.8 %	-	5.9 %	-
Adjacent to House	11.8 %	-	17.6 %	-
Compound	-	-	11.8 %	-
Garden	11.8 %	-	29.4 %	-
Adjacent to Kitchen	-	-	5.9 %	-
Adjacent to Weaving House	5.9 %	-	-	-

The majority of *mana* households in both Zuza and Guyla put their discarded vessels inside their houses, although Guyla *mana* households also put discarded vessels outside, either adjacent to the house or in the compound. In addition, 83.3 percent of the *mana* houses (i.e., five of the six houses studied) keep discarded pots within their compound. The majority of *degala* households in both Etello and Guyla put their discarded vessels, in association with each other, outside either in the garden

or compound. Only one Guyla *degala* household put a discarded vessel by itself inside their kitchen.

Table 6-11: Percentage of Etello caste households and the location of vessels stored during discard.

Caste	*mala*	*degala*	*mala*	*degala*
Discard Types	Single Vessel	Single Vessel	Two or More Vessels	Two or More Vessels
House	17.6 %	-	5.9 %	-
Kitchen	17.6 %	-	23.5 %	-
Compound	5.9 %	-	5.9 %	-
Garden	-	-	-	66.7
Adjacent to Kitchen	-	-	5.9 %	-
Store House	5.9 %	-	-	-

Table 6-12: Percentage of Guyla caste households and the location of vessels stored during discard.

Caste	*mala*	*mana*	*degala*	*mala*	*mana*	*degala*
Discard Types	Single Vessel	Single Vessel	Single Vessel	Two or More Vessels	Two or More Vessels	Two or More Vessels
House	21.4 %	33.3 %	-	7.1 %	33.3 %	-
Kitchen	35.7 %	-	33.3 %	21.4 %	-	-
Adjacent to House	7.1 %	33.3 %	-	-	-	-
Compound	-	33.3 %	-	7.1 %	-	33.3 %
Garden	7.1 %	-	-	-	-	-

Although caste households parallel the results in the village spatial analysis, the household context of different caste households demonstrates that differences do occur. Since *mala* households have more structures than do the *mana* or *degala* caste households, they are able to place pots in more locations than can the lower castes. The spatial analysis of pots may help to identify the social status of a household, as the

location of reuse vessels grouped together among Guyla *mana* households (e.g., groups of vessels in the firing area) demonstrate ceramic production areas.

Economic Rank and the Spatial Analysis of Household Ceramics

Primary-use

The economic wealth of a household, especially the frequency of structures per household, determines the spatial placement of ceramic vessels throughout their life-cycle. Poorer households have less access to storage space, which effects where they store their ceramic pots during different life-cycle stages. However, the richer households have more structures and more area in which to store their ceramic vessels (Figures 6-1 and 6-2).

During the primary-use stage of the ceramic life-cycle, vessels belonging to the lowest rank keep a majority of their primary-use vessels inside their houses. While the higher ranked households also keep a majority of their primary-use vessels inside their houses, they also place vessels inside their kitchens. The number of buildings among the poorest ranked households in Zuza and Etello average only 1.1 and 1.0 per household, respectively. The first ranked households, which are economically the wealthiest households, have an average of 2 and 4.6 buildings per household in Zuza and Etello, respectively. Therefore, the poorest households in Zuza and Etello are restricted to keeping their primary-use vessels inside their houses. Guyla has only two economic ranks but the second has fewer buildings per compound with 2.1 buildings, compared to 3.4 buildings per compound among the wealthiest Guyla households. This reflects where households place their primary-use vessels. A higher percentage of

Guyla's first-ranked households keep their primary-use vessels in both their houses and kitchens, than do Guyla's second-ranked households (see Tables 6-13, 6-14, and 6-15).

Table 6-13: Percentage of Zuza ranked households and the location of vessels stored during primary-use.

Economic Rank	Rank 1	Rank 2	Rank 3	Rank 1	Rank 2	Rank 3
Storage Types	Single Vessel	Single Vessel	Single Vessel	Two or More Vessels	Two or More Vessels	Two or More Vessels
House	20 %	14.3 %	-	60 %	85.7 %	100 %
Kitchen	20 %	28.6 %	25 %	40 %	14.3 %	-
Adjacent to House	-	-	-	20 %	42.8 %	-
Compound	20 %	-	-	-	14.3 %	-
Garden	-	-	12.5 %	-	-	-

Table 6-14: Percentage of Etello ranked households and the location of vessels stored during primary-use.

Economic Rank	Rank 1	Rank 2	Rank 3	Rank 1	Rank 2	Rank 3
Storage Types	Single Vessel	Single Vessel	Single Vessel	Two or More Vessels	Two or More Vessels	Two or More Vessels
House	40 %	18.2 %	25 %	60 %	81.8 %	75 %
Kitchen	20 %	-	-	60 %	45.4 %	-
Compound	20 %	9.1 %	-	-	-	-
Store House	-	9.1 %	-	20 %	-	-

Table 6-15: Percentage of Guyla ranked households and the location of vessels stored during primary-use.

Economic Rank	Rank 1	Rank 2	Rank 1	Rank 2
Storage Types	Single Vessel	Single Vessel	Two or More Vessels	Two or More Vessels
House	-	-	100 %	100 %
Kitchen	14.3 %	23.1 %	85.7 %	23.1 %
Adjacent to House	14.3 %	23.1 %	-	-
Compound	-	7.7 %	28.6 %	-
Adjacent to Kitchen	14.3 %	7.7 %	-	-
Store House	14.3 %	-	-	7.7 %
Weaving House	-	-	14.3 %	7.7 %

Reuse

After pots have broken, the different Zuza economic ranked households continue to store pots either individually or in groups in the houses and kitchens. As vessels enter their reuse stage, Zuza's wealthier households store more individual pots in their house, whereas the two lowest ranked households store more individual pots outside. Zuza households store their reuse vessels in clusters, within and adjacent to their houses and their kitchens (see Table 6-16).

Etello's economic ranks are more clearly delineated concerning the location of their household ceramics, than the other two villages. Etello's poorest households have only one house each and so reused vessels are stored individually and in groups within the house. Etello's first and second economic ranks are similar to one another, with both individual and group vessels more widely distributed in other areas because these

households are wealthier and have more buildings in which to store vessels (see Table 6-17).

The largest difference between Guyla's economic ranks is that, except for the individual pots, all of the wealthiest households keep all of their reuse vessels grouped together within structures (see Table 6-18). This contrasts with the second-ranked households, which keep some of their reuse vessels clustered outside in the compound. The storage of reuse vessels that cluster together follow the general pattern found among the storage of primary-use vessels. The only exception is that more of Guyla's second-ranked households now store reused pots in the firing areas since they belong to the *mana* caste. All three village's economic ranks generally follow the village trend, with reuse vessels associated less within houses and kitchens than during the primary-use stage.

Table 6-16: Percentage of Zuza ranked households and the location of vessels stored during reuse.

Economic Rank	Rank 1	Rank 2	Rank 3	Rank 1	Rank 2	Rank 3
Storage Types	Single Vessel	Single Vessel	Single Vessel	Two or More Vessels	Two or More Vessels	Two or More Vessels
House	40 %	-	12.5 %	40 %	71.4 %	87.5 %
Kitchen	-	14.3 %	-	20 %	-	25 %
Adjacent to House	-	14.3 %	25 %	20 %	14.3 %	12.5 %
Compound	-	-	25 %	-	14.3 %	-
Garden	-	-	12.5 %	-	-	-
Adjacent to Kitchen	-	-	-	-	14.3%	-

Table 6-17: Percentage of Etello ranked households and the location of vessels stored during reuse.

Economic Rank	Rank 1	Rank 2	Rank 3	Rank 1	Rank 2	Rank 3
Storage Types	Single Vessel	Single Vessel	Single Vessel	Two or More Vessels	Two or More Vessels	Two or More Vessels
House	20 %	18.2 %	50 %	20 %	36.4 %	50 %
Kitchen	40 %	36.4 %	-	20 %	27.3 %	-
Adjacent to House	20 %	-	-	-	-	-
Adjacent to Kitchen	-	9.1 %	-	-	9.1 %	-
Store House	-	-	-	20 %	9.1 %	-

Table 6-18: Percentage of Guyla ranked households and the location of vessels stored during reuse.

Economic Rank	Rank 1	Rank 2	Rank 1	Rank 2
Storage Types	Single Vessel	Single Vessel	Two or More Vessels	Two or More Vessels
House	14.3 %	15.4 %	42.8 %	76.9 %
Kitchen	28.6 %	15.4 %	71.4 %	53.8 %
Adjacent to House	-	7.7 %	-	7.7 %
Compound	28.6 %	-	-	7.7 %
Garden	14.3 %	7.7 %	-	-
Adjacent to Kitchen	-	23.1 %	-	-
Store House	-	-	-	7.7 %
Weaving House	-	-	14.3 %	7.7 %
Pottery Firing Area	-	-	-	7.7 %
Abandoned Adjacent House	7.7 %	-	-	-
Adjacent to Workhouse	-	-	-	7.7 %

Discard

Once pots have completed their reuse stage, households begin to place a majority of provisionally discarded pots in their houses and/or kitchens. This occurs in all economic ranks among the three villages. In addition, people begin to place an increased number of discarded pots in outside areas, usually adjacent to buildings or in the compound or garden. Both Zuza's and Etello's poorest-ranked households store all of their discarded pots in clusters in the garden area. This is possibly due to their lack of storage space because all of these households, except for one, have only one structure in their compound (see Tables 6-19, 6-20, and 6-21).

Table 6-19: Percentage of Zuza ranked households and the location of vessels stored during discard.

Economic Rank	Rank 1	Rank 2	Rank 3	Rank 1	Rank 2	Rank 3
Storage Types	Single Vessel	Single Vessel	Single Vessel	Two or More Vessels	Two or More Vessels	Two or More Vessels
House	20 %	42.8 %	62.5 %	20 %	-	-
Kitchen	20 %	14.3 %	12.5 %	-	-	-
Adjacent to House	-	14.3 %	12.5 %	20 %	28.6 %	-
Compound	-	-	-	20 %	14.3 %	-
Garden	-	14.3 %	-	-	-	75 %-
Adjacent to Kitchen	-	-	-	-	14.3 %	-
Adjacent to Weaving House	-	14.3 %	-	-	-	-

Table 6-20: Percentage of Etello ranked households and the location of vessels stored during discard.

Economic Rank	Rank 1	Rank 2	Rank 3	Rank 1	Rank 2	Rank 3
Storage Types	Single Vessel	Single Vessel	Single Vessel	Two or More Vessels	Two or More Vessels	Two or More Vessels
House	-	27.3 %	-	-	9.1 %	-
Kitchen	20 %	18.2 %	-	20 %	27.3 %	-
Compound	20 %	-	25 %	-	9.1 %	-
Garden	-	-	-	-	-	50 %
Adjacent to Kitchen	-	-	-	-	9.1 %	-
Store House	-	9.1 %	-	-	-	-

Table 6-21: Percentage of Guyla ranked households and the location of vessels stored during discard.

Economic Rank	Rank 1	Rank 2	Rank 1	Rank 2
Storage Types	Single Vessel	Single Vessel	Two or More Vessels	Two or More Vessels
House	42.8 %	7.7 %	-	15.4 %
Kitchen	71.4 %	7.7 %	-	23.1 %
Adjacent to House	-	15.4 %	-	-
Compound	-	7.7 %	14.3 %	7.7 %
Garden	-	7.7 %	-	-

The spatial placement of vessels within the household of the different economic ranks depends on the vessels' particular life-cycle stage. The primary-use and reuse vessels are usually stored in the house or kitchen for all economic ranks and then, as vessels reach their discard stage, people begin to store discarded vessels in different outdoor areas of the compound. The economic ranks among the different villages vary in the number of buildings, with the poorer households having fewer buildings compared to the wealthier households and this influences the placement of

vessels. The wealthier household compounds have a larger number of buildings so vessels can be stored in more diversified areas of the compound. The poorer households usually only have one building per compound. Therefore, the economic wealth of a household determines the spatial organization of the household ceramic assemblage.

Gamo Ceramic Use-Alteration Analysis

This use-alteration analysis focuses on the question of whether vessels that are in different stages of their life-cycle have different use-alteration patterns? Use-alteration patterns (e.g., carbon deposition and/or surface attrition) can provide archaeologists with clues concerning how people used the vessel during a specific life-cycle stage. The Gamo use vessels differently based on the vessel's form, which is also dependent upon the vessel's present life-cycle stage. For example, an unbroken *otto* may function for cooking, but once it breaks, households may use it to store crops. This analysis discusses the ceramic life-cycle and corresponding use-alteration patterns at the Gamo scale, rather than at the village, social group, and economic rank level. People in all regions and social and economic backgrounds use cooking pots for multiple cooking functions. There are no patterns representing regional, social, and economic groups because of the multi-functionality of Gamo cooking vessels.

The Gamo use a single hearth located usually in the central area of their main house and/or kitchen. They also may construct a hearth outside. The Gamo construct hearths by having a single hole in the floor of the house or kitchen and in the hole is placed a *chochay*, a cylindrical ceramic piece that the potters manufacture.

Surrounding the *chochay* are either three large spherical rocks or three *mastakalays*, which are ceramic pot supports located above the *chochay* on the floor surface. The majority of households use rocks as pot supports rather than the *mastakalays*.

The food that households cook and the number of people that are eating at the household will determine the type of vessels used. During religious holidays, a *diste* (cooking pot) is usually the type that households use to prepare different types of *wat* (i.e., different types of stew), usually with chicken, meat, or lintels. During normal cooking periods, the majority of people subsist on a variety of foods such as enset, cabbage, potato, beans, peas, barley, wheat, and corn. People use the *tsaro* (small cooking jar) and *otto* (large cooking jar) pots to make different types of foods from these vegetables and grains. The Gamo have a large number of recipes that they use to provide variety to their diet. However, during the rainy season, food becomes more restricted until the crops can be harvested.

Carbon Deposition and Surface Attrition

Gamo villages use a range of different vessel types with different functions. These specific functions reveal different carbon deposition and surface attrition attributes that contribute to our understanding variation in household activities.

Primary-use

Specific use-alteration patterns were found on *jebanas* (coffee pitcher), *distes* (cooking pots), *ottos* (cooking jars), *tsaros* (cooking jars), and *batsas* (storage and beer fermentation jars). The *jebana* (coffee pitcher) is used only for boiling ground coffee beans and has a specific carbon deposition on the exterior base to upper body. The

exterior base is predominantly covered with a thick and chipping dull carbon deposit continuing up to the lower body. The maximum diameter on the exterior then changes usually to a glossy soot that can continue to the upper body. The glossy soot on the maximum diameter occurs on 58.6 percent of vessels compared to 41.3 percent having a dull soot. There is an equal percentage of dull or glossy soot on the upper body. A very glossy circle can surround the spout because traditionally people boil coffee with the *jebana* tilting with the spout nearer to the ground while the coffee is boiling. The presence of an oxidized patch on the exterior upper base to the maximum diameter is on 15.5 percent of Gamo *jebana*s. Figure 6-4 illustrates the presence of exterior carbon deposits found on *jebana*s. Due to the restricted orifice on the *jebana*, it was not possible to analyze the interior use-alteration attributes.

*Diste*s (cooking pot) function for multiple types of cooking but the majority of Gamo people use *diste*s for cooking different types of *wat* (lintel, chicken, or meat stew) and also boiling cabbage and cooking *enchila* (i.e., a type of food consisting of a grain, either barley, wheat, or maize, cooked with fermented enset). On the majority of *diste*s, the interior base has a dull carbon deposit ranging from light to thick/chipped carbon. There is no difference in what a person cooks that would cause either a dull light carbon or heavy carbon in the *diste*'s interior. The difference seems to be whether the liquid in the *wat* evaporates causing the food to burn. Burning food creates a thick dull carbon deposit. The *diste*s that have either a dull light carbon deposit or a dull thick carbon deposit on the interior base will usually have this type of carbon deposit continue to the upper body and to the rim. Figures 6-5 and 6-6 illustrate the types and presence of interior carbon deposition on *diste*s.

The *diste*'s exterior has an oxidized patch on 9.6 percent of the primary-use *distes*. Both *jebanas* and *distes* have a higher percentage of oxidized patches on their exteriors than do other types of cooking vessels. Because the *diste* base is flat, there are no carbon deposits on the exterior base on the majority of *distes*. The flat base causes the fire to hit directly on the surface, whereas a round base will have carbon deposits attaching to the exterior wall. There are also no carbon deposits found on the central base section of *baches* (baking plates), which are roasting plates used to cook bread and roast different types of grain and coffee. The majority of *distes* have a dull thick soot on the exterior lower body that continues up to the upper body. Some *distes* have a light to thick glossy soot that will continue also to the upper body. There are two reasons why some *distes* (cooking pots) and *jebanas* (coffee pitchers) have a glossy carbon deposit and others do not. This may be based on how much liquid remains in the pot to keep it cool and/or how far the pot is placed above the hearth (Skibo 1992:152-168; Hally 1983). Figures 6-7 and 6-8 illustrate the types and presence of exterior carbon deposition on *distes* (cooking pots).

The two types of cooking jars (i.e., *otto* and *tsaro*) function for multiple types of cooking activities. It is not uncommon for a person to use a cooking *otto* or *tsaro* to boil cabbage, then the next day to boil potatoes and then a few days later to cook *enchila*. This multiple use of ceramic pots challenges the ethnoarchaeologists to find use-alteration patterns. However, multiple-use vessel types provide an interesting pattern that may determine whether a vessel functioned for boiling foods with a liquid or for dry cooking. The majority of recipes that Gamo people use to cook foods in a pot (i.e., *diste*, *otto*, or *tsaro*) contain some amount of water. The particular food may

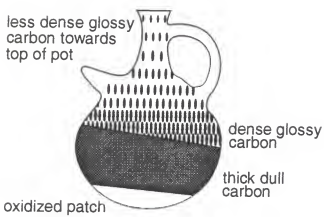

Figure 6-4: *Jebana* (coffee pot) vessel with a characteristic exterior carbon pattern caused by boiling water and tilting the pot on the hearth.

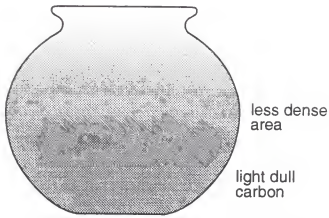

Figure 6-5: *Diste* (cooking pot) vessel with a characteristic interior carbon pattern caused by boiling foods.

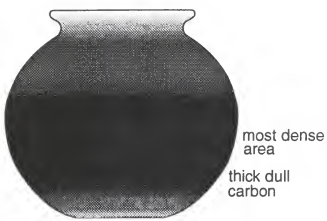

Figure 6-6: *Diste* (cooking pot) vessel with a characteristic interior carbon pattern created when water evaporates causing food to burn onto the interior wall.

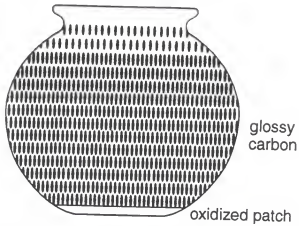

Figure 6-7: *Distes* (cooking pot) vessel with a characteristic exterior carbon pattern caused by boiling foods.

Figure 6-8: *Distes* (cooking pot) vessel with a characteristic exterior carbon pattern created when water evaporates.

be thicker in consistency such as *shona / moyde* (i.e., a type of porridge) than foods that only require a simple boiling. The general pattern on all multiple use pots is either a thin or thick dull carbon deposition from the base to the upper body on both the interior and exterior wall. The amount of carbon deposition is dependent upon how much water is boiled out, which causes the food to adhere to the interior of the vessel wall and burn. While measuring the use-alteration and morphological attributes of cooking pots, it was not uncommon to find food such as enset, potatoes, etc. burned on the interior of the vessel from the base to the upper body. This type of carbon deposition usually remains on the pot as the Gamo only gently rinse the vessel and do not actively wash all of the carbon residue from either the interior or exterior ceramic wall. However, the *tsaros* and *ottos* that function only for boiling water or foods such as cabbage have a glossy soot on the exterior surface, from the base to upper body caused by the water cooling the pot's surface. Figures 6-9, 6-10, 6-11, and 6-12 provide examples of both types of interior and exterior carbon deposition found on Gamo cooking jars.

The analysis of surface attrition on Gamo vessels was conducted on all vessels. However, the thick carbon deposits and the use of dung on the exterior cooking vessels from the base to the maximum diameter made attrition observations difficult. All of the vessels that function to process beer had a large amount of erosion on the interior portion of the vessel wall. This is due to the yeast activity within the beer that eventually erodes the interior vessel wall. In addition, this erosion was a major cause of large storage vessels (i.e., *batsa*) breaking when the person pours the boiling beer into the *batsa* for fermentation. The *batsa* vessel wall becomes so thin from previous

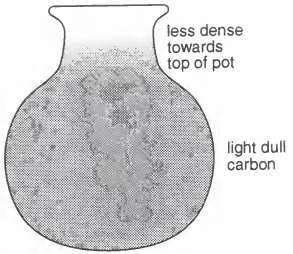

Figure 6-9: Multiple use Gamo pots with a characteristic interior carbon pattern created when food is boiled.

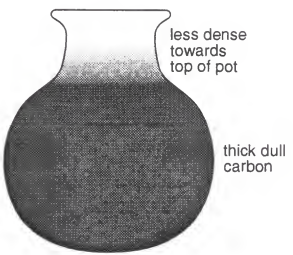

Figure 6-10: Multiple use Gamo pots with a characteristic interior carbon pattern created when the food has a thick consistency or the amount of water is reduced.

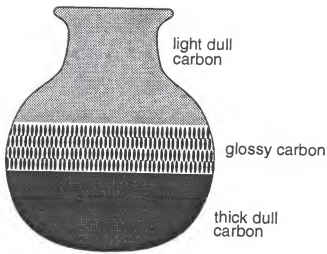

Figure 6-11: Multiple use Gamo pots with a characteristic exterior carbon pattern created when food is boiled.

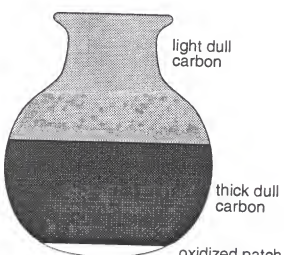

Figure 6-12: Multiple use Gamo pots with a characteristic exterior carbon pattern.

yeast activity, causing large pits and in some cases complete erosion of the wall, that the thermal stress is so great as to cause the vessel to crack at the base. Pots that function to cook, store, cool, or transport beer all had erosion on the interior part of the vessel wall. Pitting and erosion occur from the interior base up to the upper body and in some cases up to the rim, so that there is erosion of the entire interior part of the vessel. Since lower caste and economic rank households do not usually produce beer, this is the only type of use-alteration pattern that may reflect socioeconomic variation. Interior erosion also occurs on vessels used to make dough. The erosion occurs because the yeast in the dough breaks down the interior wall surface. Figure 6-13 illustrates the presence of erosion due to the processing of beer.

Reuse

Depending on the severity of the break, a cooking vessel's secondary function does not usually involve cooking but rather storage of crops. Yet, approximately half of the cooking pots retain some form of carbon deposition after the vessel functions for storage or some other secondary use. Providing that there is good post-depositional preservation, archaeologists should be able to decipher at least half of the cooking vessels even after the vessels change from a cooking to a storage function. The vast majority of reused vessels are stored in either the main house or kitchen, which protects the carbon deposits from erosional factors. The reuse of vessels that have pitting or erosional attrition on the interior vessel wall continue to show these patterns. Some large storage jars that have cracked continue to be used for fermenting beer, if the crack does not cause severe leaking. Over time, this will cause even more erosion on the vessel's interior wall.

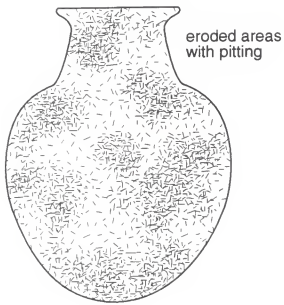

Figure 6-13: Gamo vessel with characteristic erosion caused by fermenting beer.

Discard

Households sometimes do not reuse a vessel after it breaks, but instead discard the vessel in the household compound. The majority of discarded cooking vessels continue to have carbon deposits on the interior and exterior portion of the vessel. Discarded cooking vessels that are provisionally stored outdoors in the compound or garden also have visible signs of carbon residue, suggesting that the carbon deposits will possibly withstand certain formational processes. Surface attrition found on discarded vessels are also present after the household discards the vessel into the household compound.

Although the majority of ceramics that archaeologists find are broken sherds and not whole vessels, use-alteration analysis can provide archaeologists with valuable information concerning ceramic use. As long as formation processes do not dramatically change the carbon or attrition attributes, these attributes should remain relatively intact. This research among the Gamo indicates that although the majority of pots have multiple functions, initial use-alteration attributes remain throughout the life-cycle.

Summary and Conclusions

The spatial analysis of ceramics promotes the deciphering of the distinct stages of the ceramic life-cycle and the social and economic wealth of a household. The location of pots within the household context provides archaeologists with a key to understanding ceramic stages of use. People tend to store pots inside that are in primary-use and to store pots outside that are in secondary use and discard. The

majority of Gamo primary-use vessels are stored in clusters in the main household and/or kitchen. Once vessels break, the majority still are stored within the main household and/or kitchen but a gradual shift occurs where more households begin to place broken individual reuse vessels outside. Therefore in Gamo, as the life-cycle changes from primary to discard, pots become less formally placed within the compound. However, even in storerooms, as previously discussed, people informally store a variety of vessel types and sizes. The only formal place within a household occurs on the bamboo walls where people hang serving vessels and on the racks above the walls where people place large storage vessels.

Deal's (1998:86-89) ethnoarchaeological research among the Tzeltal Maya villages of Chanal and Aquacatenango also discovered that villages informally store their ceramic vessels in the interior and exterior areas of their houses and kitchens and a combination of these structures. However, Deal found that certain types of vessels are stored formally in specific locations, for instance, water carrying jars are stored outside in depressed areas adjacent to the house and along the patio. Larger vessels are more likely to be stored on the ground than on racks (Deal 1998:89). In addition, vessels that reflect social value, such as ritual vessels and family heirlooms, are stored with more care than utilitarian vessels (Deal 1998:88-89). The Gamo do not have ritual vessels, therefore a comparison cannot be made to the Maya. However, the Gamo tend to store large vessels both on the ground and on racks.

I consider discard pots as those that informants stated had no function, but at the same time were kept in various places within the household. Nelson (1991:171) terms this type of storage as "dead storage", which he observed among the Maya. In

addition, Deal (1985:253, 1998:118-123) and Lindahl and Matenga (1995:106) both describe broken vessels being stored in provisional discard among the Maya of Mexico and the Shona of Zimbabwe, respectively. Discarded vessels among the Tzeltal Maya represent two distinct types of household placement (Deal 1998:118-122). One is the isolated storage of ceramic vessels in out-of-the-way areas that are often lost. The placement of these vessels indicates little value to the household and it is expected that they would be left behind when the people abandon their houses. The second type of spatial placement is a cluster of pots that are in continuous use (Deal 1998:118-122). These clusters of pots are found along the outer areas of structures. Among the Shona, broken discarded vessels are stored in association with unbroken rarely used vessels, under raised floors of granaries protecting vessels from further destruction by livestock (Lindahl and Matenga 1995:106). The Gamo indicate similar types of discard patterns, with broken, discarded pots that are eventually lost when stored in storage rooms, on racks, under benches and beds. Clusters of pots are found adjacent to the exterior walls of structures and are either used for water storage or are kept for future use. Both types could be wrongly interpreted as representing different activities in the archaeological record.

Archaeologists can determine the socioeconomic status of a household from the spatial location of their pots. For instance, lower socioeconomic households have fewer households and less space for storage. Hence, pots in these households tend to cluster more than in higher caste and wealthier households. The spatial patterns among different Gamo castes indicates that the *mana* and *degala* castes have a more restricted household area to place their pots than *mala* households. The clustering of vessels

among the *mana* households in association with workshops and firing areas are a specific signature for deciphering potter households. The different economic ranks parallel the caste analysis in that poorer households have a more restricted household area, causing a confinement of ceramic vessels compared to the larger households of the wealthy Gamo. Deciphering caste households from economic ranked households based on the spatial analysis of ceramics is difficult because of their parallel patterning throughout the life-cycle. However, the ceramic vessels and their associated materials for ceramic production (e.g., firing areas, workshop areas that show evidence of unfired clays and production tools) and hide-working (lithic material associated with the house and/or kitchen hearth) may help to identify the household occupation, which is associated with Gamo social status. In conjunction with the spatial patterning of ceramic vessels, the number of structures present and frequency of vessels and vessel types within the household compound assists in interpreting the economic wealth of a household.

Use-alteration analysis provides the archaeologist with the means to decipher the specific use of a vessel. For instance, the location and presence of carbon may indicate the types of foods cooked and how they were cooked. Because different socioeconomic groups consume different foods, an analysis of ceramic use-alteration may provide another avenue for identifying socioeconomic status. Ethnoarchaeological research among the Kalinga indicated that exterior and interior carbon deposition patterns and oxidized patches reveal the different types of foods cooked and the different types of cooking practices (Skibo 1992). There are three main factors affecting carbon deposition on the interior of the vessel: (1) heat intensity; (2)

moisture in the interior; and (3) source of heat (Kobayashi 1994:144; Skibo 1992:148). Observations revealed that when food either adheres to or is absorbed into a vessel, it creates interior carbon deposition. The portion of the vessel that is closest to the fire will exhibit interior carbon deposits because the food will eventually carbonize, especially if there is a reduction in moisture (Kobayashi 1994:165; Skibo 1992:152). The patterns of exterior carbon deposits and oxidized patches indicate how the vessel was placed over the fire, the intensity of the fire, the general contents of the vessel, and the degree of permeability of the vessel wall (Skibo 1992:179). Gamo cooking is diverse but the majority of cooking is with boiling water. The use-alteration analysis of Gamo cooking vessels indicates that cooking is usually done in the wet mode. However, the carbon deposits will change as people leave vessels on the fire too long, causing the water to evaporate and food to burn on the interior wall. This is similar to the description given by Skibo and Blinman's (1999:179-182) analysis of seed jars used in the American Southwest sites from the Prayer Rock caves, where vessels are distinguishable from a wet or dry mode of cooking.

As with carbon analysis, our preliminary understanding of the processes that affect surface attrition attributes in use-alteration analysis are based on experimental and ethnoarchaeological studies (Schiffer and Skibo 1989; Skibo 1992; Skibo and Schiffer 1987). There are three main factors that affect the processes of surface attrition: (1) characteristics of the ceramic material (paste hardness; surface porosity; surface treatments; and hardness, size, shape, and quantity of temper); (2) characteristics of the abrader; and (3) the interaction between the ceramic vessel and abrader (Schiffer and Skibo 1989; Skibo 1992). Hally's (1983) research, which

focused on two Barnett phase sites in Georgia found severe erosion on the interior vessel wall of large carinated bowls and large pinched rim jars. He attributes this interior surface attrition to the chemical corrosion of liquids in the preparation of foods (Hally 1983:19). Patterns of severe pitting and erosion are associated with the processing of beer, which occur on 100 percent of all Gamo beer processing vessels. The fermentation of the yeast seems to affect all different types of clays, as attrition occurs throughout the Gamo region among vessels manufactured from different clays sources, and is the cause for the majority of surface attrition on Gamo vessels. In addition, Gamo serving bowls that were used to serve or store fermented foods (e.g., fermented enset) have evidence of severe erosion on the interior vessel wall.

Two studies discuss the association between use-alteration and socioeconomic levels- Griffiths (1978:77) and Smith (1987:314)- who suggest that the lower socio-economic households should use their valuable serving vessels less often than wealthier households, causing fewer use-alteration attributes. However, the Gamo do not have a distinction between ceremonial and utilitarian serving vessels. In contrast, the pitting associated with beer fermentation in Gamo society is a direct indicator of social status and economic wealth. Since lower caste and economic ranked households in Gamo do not ferment beer, the lack of pitting in the ceramic assemblage is an indicator of a household's socioeconomic level.

The spatial and use-alteration analyses clarify the household use of ceramics during their different life-cycle stages, as well as indicating the distinctions between villages, castes, and economic ranks. Defining the different life-cycle stages based on their spatial and use-alteration analyses enables archaeologists to present more

accurate models concerning the type of abandonment that may have taken place at the household level.

CHAPTER 7
HOUSEHOLD POPULATION AND CERAMIC USE-LIFE

In the last three chapters, I discussed the life-cycle of Gamo household pots in relation to their regional, social, and economic contexts. This chapter explores how household pots correlate with household population and use-life. Previous archaeological and ethnoarchaeological research has looked at the relationship between household population and vessel size (Mills 1999; Nelson 1981; Shapiro 1984; Tani 1994; Turner and Lofgren 1966). In addition to the possible link between household size and pottery, the social status and economic wealth of a household may relate to the size of household vessels (Deal 1998; Hayden and Cannon 1984; Nelson 1981; Smith 1987; Tani 1994; Trostel 1994). There also are many factors that may affect the use-life of household vessels, including household size (Tani 1994), vessel size (Birmingham 1975:384; David and Hennig 1972; DeBoer 1985; de la Torre and Mudar 1982; Longacre 1985:340; Shott 1996), production methods (see Chapter 4) (Arnold 1991:72; Bankes 1985:275-276; Deal 1983:155; Foster 1960; Okpoko 1987:452), and use (see Chapter 5) (Bankes 1985:72; Foster 1960; Reid 1989; Tani 1994). This chapter reveals that a village without potters has more correlations between household population and frequency of vessel types, vessel frequency, and size than villages where potters reside. Villages without potters also have stronger correlations between the household size of different social castes and economic ranks

and vessel frequency and size than the pottery-producing villages. Vessel use-life analysis indicates that consumer opinions of pottery correlate with a vessel's longevity. In addition, a vessel's use-life is determined by the production techniques and materials that potters use, as well as the function, frequency of use, volume, and the pot's cost. Finally, vessel size and feasting is explored, to show that households holding *Halaka* feasts in the past have a higher frequency of large storage jars (*batsa*) and gourds for drinking beer than non-*Halaka* households.

Household Developmental Cycle

Researchers studying households have discussed in great depth the role of the developmental cycle and how it affects the social and economic structure of households (Netting et al. 1984). The economic and social makeup of a Gamo household depends, in part, upon the productive capabilities and its determined caste group. As discussed in Chapter 1, a household that belongs to the highest caste (i.e., *mala*) may be poorer economically than a lower caste (i.e., *degala*) because of the demographic makeup of the household. Among the three Gamo villages I studied, Zuza provides for the best example of how the household population affects the size and frequency of ceramic vessels. There are six households in Zuza that are inhabited by widows who belong to the *mala* caste, but all six households are within the lowest economic rank in terms of wealth because their only livelihood is spinning cotton. Although these households are members of the highest caste in Gamo, their economic wealth is lower than some *mana* and *degala* households. Another important social factor that affects the demographic and economic context of Gamo households is the

larger Ethiopian economy. A number of Gamo families are without husbands because they migrated to one of the larger towns or cities to weave. They can sell their woven goods at a higher price in a larger town than if they stayed in their Gamo village. These types of household variations have an important effect on the material culture of the household, specifically on the frequency and size of vessels used for the processing of food.

Vessel Types and their Size Range

Gamo vessel types and sizes are affected by the household context in terms of its population, and its social and economic attributes. Three other important factors, discussed in Chapter 4, that effect which vessel types Gamo people use are: (1) their village location in terms of which markets potters sell their wares; (2) potters living in their village; 3) and the types of vessels that are sold where consumers purchase their pots. Each Gamo vessel has the potential to provide a range of different uses including cooking, serving, storage, and transporting. The only exceptions are the *jebana* and *guya*, which are used only to boil ground coffee and smoke tabacco, respectively. In addition to having a range of uses for the majority of vessel types, the types also range in size, which allows consumers to choose which vessels are best suited for their specific household needs (Table 7-1).

Village Analysis

The three villages of Zuza, Guyla, and Etello each have their own social and economic structure because of the different portions of caste members and economic

ranked households present. Therefore, the relationships between household populations and vessel frequency, size, and use-life will indicate the similarities and differences that occur between the three villages, but also within one society. The frequency and size of vessels that functioned for cooking, serving, storing, and transporting are compared with household population to test if there are significant correlations in each village.

Table 7-1: Gamo vessel types and their corresponding primary-use and capacity.

Emic Types	Primary-use	Mean Capacity (liters)	Size Range (liters)	s.d.
Jebana (n=60)	Boil Coffee	2.14	0.60-3.05	0.57
Diste (n=61)	Vegetable and Grain Cooking	8.40	0.90-65.42	8.93
Otto (n=188)	Vegetable, Grain, and Beer Cooking	12.63	3.88-50.94	6.04
Otto (n=80)	Water Storage	19.64	6.37-77.91	12.96
Otto (n=77)	Water Transport	14.10	4.85-36.07	6.41
Tsaro (n=159)	Vegetable and Grain Cooking	4.59	0.26-10.30	1.97
Bache (n=47)	Roasting Grains, Coffee, Bread, and Vegetables	4.56	0.78-7.91	1.42
Shele (n=182)	Serving	11.73	0.06-87.07	12.76
Peele (n=33)	Serving	4.73	1.15-11.81	2.14
Tsua (n=78)	Serving	1.04	0.06-3.05	0.60
Batsa (n=86)	Storage and Beer Processing	64.96	20.57-195.33	30.73
Guya (n=28)	Water Pipe	1.44	0.90-2.14	0.26

Vessel Types and Population

The examination of the number of different vessel types and household size may prove to demonstrate that households actually use types that correspond to their household size for food preparation. At the village level, Etello has a significant

correlation between the number of types a household uses and their population (r = 0.59) (Table 7-2). This may be due to Etello not having potters living within their village or region and so each household uses only the number of types that is actually needed for the household. Etello consumers must travel to one of the weekly markets to purchase their household pots, compared to the Zuza and Guyla consumers who can easily purchase their household pots from neighboring potters. Thus, the purchasing and using of ceramic vessels by Etello consumers is more closely connected with their household population than villages that have potters living in their village. In addition, the number of vessels in Etello is less than either Zuza or Guyla, which supports the argument that Etello consumers do not have a surplus of household vessels (see Chapter 4).

Table 7-2: Correlation between frequency of household vessel types and population and mean number of vessel types and household population. (Bolded values are significant at the .05 confidence level with 18 degrees of freedom).

Village	All Households	Mean Vessel Types	Mean Household Population
Zuza	0.15 (n = 20)	6.7	4.3
Guyla	0.22 (n = 20)	5.9	8.2
Etello	**0.59** (n = 20)	5.6	4.8

Vessel Frequency and Size and Household Population

This analysis indicates a relationship between household vessel frequency and volume with household population. In addition, this analysis demonstrates how the different life-cycle stages correlate between the use of ceramic vessels and the number of people living in the household.

Entire life-cycle

The frequency and volume of vessels used for cooking and serving should have a strong correlation with household population size. Storage vessels should have a weaker correlation, because their presence depends upon the agricultural productivity of each household. The number of transporting vessels and population size is expected to have a weak correlation, especially in villages that use plastic water containers. In addition, transporting vessels are dependent upon who is transporting the water or beer. For example, a child whose responsibility is to collect the household's water would use a considerably smaller vessel (e.g., *tsaro*), than an adult who is carrying beer to sell at the market (e.g., *otto* or *batsa*).

Etello is a village without potters, which demonstrates that when ceramic consumers do not have surplus household pots, their population can be correlated using ceramic vessels. Etello has a significant correlation with the frequency of the entire assemblage of vessels ($r = 0.67$), cooking vessels ($r = 0.45$), and serving vessels ($r = 0.45$) with household population. Furthermore, there is a significant correlation between Etello's mean ($r = 0.60$) and sum ($r = 0.48$) volume of cooking vessels with household population. This suggests that a consumer living in a village without potters only purchase or exchange for pots that the household population needs.

Because serving food is a communal household activity in Gamo society, it is not surprising that Zuza ($r = 0.53$) ($r = 0.53$) and Guyla ($r = 0.55$) ($r = 0.45$) have a significant positive correlation between the frequency and sum volume of serving vessels and household population. Only eleven of Zuza's households have ceramic serving vessels and when those households are correlated with vessel frequency and

volume then even stronger, significant results occur. I expected that Gamo villages would have a strong correlation between the frequency and size of serving vessels, since the Gamo people and the majority of Ethiopians eat using communal serving vessels. These significant relationships between the frequency and volume of vessels and household population suggest that given the proper context archaeologists will be able to hypothesize about relating household vessels with population.

Primary-use

Vessels in their primary stage of use are expected to correlate with household population, because during this stage pots are purchased to satisfy the household's basic food preparation needs. This is especially apparent in Etello, where the frequency of primary-use vessels significantly correlates with household population ($r = 0.63$). Other significant correlates are Zuza's ($r = 0.62$) frequency of serving vessels and Guyla's ($r = 0.49$) ($r = 0.51$) frequency and sum volume of serving vessels and household population. Although the primary-use analysis does correspond with the majority of the entire life-cycle analysis, once the ceramic vessels move to the reuse stage they dramatically differ with both entire life-cycle and primary-use correlation analysis.

Reuse

It is not expected that vessels used during the reuse stage will correlate with household size. When pots break, the user has to decide to keep or discard the pot and this is dependent on the severity of the break. Zuza's frequency ($r = 0.63$) and sum volume ($r = 0.69$) of reused cooking vessels significantly correlates with household

population. Guyla's sum volume of reused cooking vessels (r = -0.51) has a significant negative correlation with household population. The reason there is this contrast between Zuza and Guyla is that Guyla people are predominantly farmers who reuse their broken cooking pots for storage of surplus crops. However, the Zuza people rely more on weaving than farming and are more likely to continue using their broken cooking pots for cooking by tilting the cooking pot on the hearth. Zuza continues to use 37 percent of its broken cooking pots for cooking, compared to Guyla consumers who continue to use only 18 percent of their broken cooking pots for cooking.

Reused vessels usually are kept for storage and it is this functional type that one would expect to have the greatest chance for a strong or significant correlation with household size. Fifteen of Etello's households have reused storage vessels and they have a significant correlation between the mean volume of storage vessels and household population. Because of the small number of households reusing transporting vessels, they did not correlate with household population. In addition, the small number of Etello's households (n = 6) that reused only one serving vessel each prevented a correlation test. The analysis of the entire life-cycle and primary-use contained similar results, unfortunately for archaeologists once we begin the reuse stage there are no patterns similar to the entire life-cycle stage analysis.

Discard

It is expected that as the household population increases the number of discarded vessels will also increase, since more people produce more trash. However, none of the villages demonstrated a strong or significant correlation between the

number of people and the number of discarded pots. In fact, there are no significant correlations between discard vessel frequency and size with household population. The discard analysis indicates the importance of understanding abandonment behavior, since discarded vessels may be the only vessels left at a site and therefore could not be used for population studies. Hence, the need for archaeologists to understand the dynamics of household ceramic use and their corresponding life-cycle stages become apparent, if we are to provide models of household population based on household ceramic assemblages.

The village analysis indicates that to interpret village population through ceramic studies, we need to consider the social and economic context of each village. Vessel frequency and household population provides the best correlation between vessels used for cooking and serving. Etello demonstrates the most significant results between household size and vessel frequency. This indicates that a village, such as Etello, that does not have potters living within the village may have a more substantial correlation between vessel frequency and size and population. The life-cycle analysis indicates that primary-use vessels are similar to the entire life-cycle analysis, but the reuse and discard stages are considerably different than the entire life-cycle analysis. The latter are dependent upon whether the households represent farmers or another type of occupation. This is an important distinction, as archaeologists need to address the abandonment behavior of households and how this affects their analysis between the ceramic assemblage and their interpretations of household size.

Table 7-3: Summary of significant correlations (*r*) between village population and the frequency and size of different functional vessels at the 0.05 confidence level. (Z = Zuza, E = Etello, G = Guyla, F = Frequency, M = Mean Volume, and S = Sum Volume).

	All Functions	Cooking	Serving	Storage	Transportation
Entire Life-Cycle	EF,	EF, EM, ES	ZF, ZS, GF, GS	EF	-
Primary-Use	EF	-	ZF, ZM, ZS, GF, GS	-	-
Reuse	-	ZF, ZS, GS	-	EM	-
Discard	-	-	-	-	-

Use-life

The analysis of vessel use-life has important implications for archaeologists trying to understand site function, population size, occupational duration, social status, and economic wealth. However, the complexity of use-life is determined by an array of factors such as vessel size, household population, vessel function, and production techniques and materials.

The Reasons Vessels Break

How vessels break in households is a reflection of their use, movement, random acts, and production problems. The majority of cases involve use and movement of vessels. Specifically, cooking is the most common cause of vessel breakage, with the base as the most likely place where pots crack from thermal stress and shock. Because cooking vessels usually break at the base, they are not able to be reused for cooking or functions that require holding liquids because they will leak. Dropping the vessel on a stone was a common explanation for the breakage of

transport vessels especially in Zuza, where the footpaths are usually slippery and lined with rock outcrops. In terms of the production process, firing of pots causes the majority of them to break. Then there are a number of reasons given that range from use (e.g., making butter), transport (e.g., bringing home from the market), and various other factors that cause vessels to break. The process of beer fermentation erodes the interior vessel wall (see Chapter 6 on the discussion of surface attrition) and when the beer is cooked and the hot liquid is poured into the vessel, the vessel wall cannot withstand the thermal shock, causing the vessel to crack. This is one of the reasons why large beer fermentation jars have a short use-life (see use-life section below). The production of butter involves rocking the *otto* back and forth on its side for hours while the milk changes to butter. This rocking motion sometimes causes vessels to break (Table 7-4).

Use-life and Vessel Volume

Generally the larger the vessel the longer the vessel's use-life (DeBoer 1985; Longacre 1981:64; Shott 1989; Tani 1994:62), but the Gamo data do not support this (Tables 7-5, 7-6, and 7-7). There is not a strong correlation between the use-life and volume of different vessel types. This suggests that other factors may be responsible for a vessel's use-life other than size. Zuza's *diste*s and *otto*s have a significant correlation between vessel use-life and volume, respectively. The Zuza *diste*s have a shorter use-life than in Guyla and Etello. I have no answer as to why they correlate significantly in Zuza and not in Etello and Guyla. In Zuza, people primarily use *otto*s to store and transport water and beer, while in Etello and Guyla they are used for cooking. Therefore, this may possibly be a reason as to why there is a significant

correlation only in Zuza. However, *batsa*s, which people use for storing water and beer do not correlate between use-life and volume. Because Gamo people use the majority of Gamo vessels for multifunctional activities, it is difficult to find a relationship between Gamo vessel types and use-life.

Table 7-4: Reasons why vessels break with their corresponding frequency and percentages.

Reasons Why Vessels Break (n = 380)	Number / Percentage
Cooking	202 / 53.1
Dropping	59 / 15.5
Firing the vessel	32 / 8.4
Hitting a stone	26 / 6.8
Pouring *Farso* (beer) in pot	18 / 4.7
Use for a long time	12 / 3.1
Falling from storage area	3 / 0.8
Dog stepping on vessel	3 / 0.8
Broke when bringing home from market	3 / 0.8
Making butter	3 / 0.8
Picked up with one hand and it broke	2 / 0.5
Cooking with salt	1 / 0.3
Store milk and just broke	1 / 0.3
Drilling two holes in the vessel for bee house	1 / 0.3
Sitting on vessel	1 / 0.3
Child threw a stone	1 / 0.3
Hit her leg and broke	1 / 0.3
Storing *farso* (beer)	1 / 0.3
Hitting with stick	1 / 0.3
Hit on another pot	1 / 0.3
Cleaning the interior	1 / 0.3
When someone was pounding the crops in the wooden grinder	1 / 0.3
Continuous use	1 / 0.3
Cow broke while drinking water	1 / 0.3
Broke during wedding ceremony	1 / 0.3
By moving pot	1 / 0.3
Bought it broken	1 / 0.3
Cracked during production	1 / 0.3

Table 7-5: Zuza's vessel types and their use-life in years and associated volume measurements and correlation between use-life and volume. (Correlations in bold are significant at the .05 confidence level).

Type	n	Mean Use-life	Median Use-life	s. d.	Mean Volume	Median Volume	s. d.	Correlation Use-life / Volume
Jebana (coffee pitcher)	18	1.43	0.7	1.90	2.22	2.24	0.51	0.00
Diste (cooking pot)	25	2.10	1	3.18	7.70	6.37	5.88	**0.53**
Otto (cooking, storage, transporting jar)	47	10.28	1.8	22.47	17.48	14.77	11.39	**0.69**
Tsaro (cooking jar)	34	1.86	1	1.89	4.58	3.88	2.20	-0.09
Bache (baking plate	14	2.41	1.4	3.53	4.36	4.14	1.53	0.22
Shele (serving bowl)	9	5.54	1	9.13	11.58	11.38	9.19	0.00
Peele (serving dish)	-	-	-	-	-	-	-	-
Tsua (serving jar)	5	7.88	1	15.17	0.95	0.9	0.41	-0.31
Batsa (storage and beer processing)	1	2	2	-	64.50	64.50	0	-
Guya (water pipe)	-	-	-	-	-	-	-	-

Table 7-6: Guyla's vessel types and their use-life in years and associated volume measurements and correlation between use-life and volume. (Correlations in bold are significant at the .05 confidence level).

Type	n	Mean Use-life	Median Use-life	s. d.	Mean Volume	Median Volume	s. d.	Correlation Use-life / Volume
Jebana (coffee pitcher)	8	1.76	1.5	1.14	2.11	2.14	0.36	0.43
Diste (cooking pot)	3	2.96	2.9	1	7.28	7.7	1.16	**-0.96**
Otto (cooking, storage, transporting jar)	73	2.51	2	2.43	12.08	10.88	4.96	0.00
Tsaro (cooking jar)	41	1.97	1.9	1.85	5.25	5.57	1.88	-0.12
Bache (baking plate	7	2.28	3	1.97	3.67	3.76	1.94	0.59
Shele (serving bowl)	29	2.09	1.9	2.15	21.25	12.11	20.37	0.25
Peele (serving dish)	9	2.3	2	2.35	5.41	4.42	2.76	0.00
Tsua (serving jar)	10	5.14	6	3.09	0.98	0.9	0.43	-0.08
Batsa (storage and beer processing)	24	2.62	1.5	2.76	64.11	59.72	33.85	0.36
Guya (water pipe)	3	1.63	2	1.48	1.72	1.59	0.36	**-0.87**

Table 7-7: Etello's vessel types and their use-life in years and associated volume measurements and correlation between use-life and volume. (Correlations in bold are significant at the .05 confidence level).

Type	n	Mean Use-life	Median Use-life	s. d.	Mean Volume	Median Volume	s. d.	Correlation Use-life / Volume
Jebana (coffee pitcher)	5	1.34	0.2	1.87	2.2	2.35	0.37	0.20
Diste (cooking pot)	8	1.81	1.7	1.26	7.85	7.23	2.7	0.21
Otto (cooking, storage, transporting jar)	29	2.31	2	2.10	11.49	10.30	5.33	0.18
Tsaro (cooking jar)	17	1.47	1	1.18	4.55	4.19	1.78	-0.09
Bache (baking plate	4	2.35	1.3	3.03	5.14	4.56	1.16	-0.51
Shele (serving bowl)	6	1.03	1	0.85	16.16	13.12	11.63	**0.96**
Peele (serving dish)	1	46	-	-	5.16	-	-	-
Tsua (serving jar)	4	3.02	3	2.54	1.19	1.24	0.58	**0.73**
Batsa (storage and beer processing)	11	5.42	3	5.60	49.18	44.58	30.03	0.11
Guya (water pipe)	1	7.9	-	-	1.44	-	-	-

Use-life and Vessel Function

The function of a vessel is one of the most important determinations for how long a vessel will survive before it breaks (Tables 7-8 and 7-9). Vessels in Gamo have a large range of uses with some pots functioning only as cooking pots, while other pots are used for cooking, storing, and transporting. Four functional categories were analyzed concerning their relationship with use-life, cooking, serving, storage, and transporting. The multifunctional vessels were considered in each of the functional categories.

The shortest use-life occurs among cooking vessels, which is not surprising since cooking pots continuously used in a hearth break from repeated thermal stress and shock. Serving vessels range in their use-life among the three villages from 1.5 to 2 years (median) and are broken because of their constant use within the household.

Serving food is a communal activity in Gamo society and therefore every member of a household handles serving vessels. Such widespread activity within the household provides a higher chance for serving bowls and dishes to break. In all three villages, storage vessels have the longest use-life, and they are the largest pots by volume. Therefore, on a functional basis, larger pots do last longer than smaller pots. People usually break transport vessels by slipping on the footpaths, dropping the vessels, or hitting the pot on a rock while carrying the vessel on their back. Except for the use-life of storage vessels in Zuza, the range of median use-lives among the different functional categories is small.

Use-life and Production

Production techniques and materials may be factors that determine the use-life of vessels. Considering the range of techniques and materials used throughout the Gamo region, it is important to analyze the different pots that were produced in specific villages/regions to see if specific production methods affect the use-life of pots. In addition, the Gamo consumers believe that certain villages/regions produce the "best" pottery based on technological reasons (see Chapter 4). Therefore, the use-life analysis will test if potters that produce the "best" pottery actually produce pots with longer use-lives.

The consumers in Zuza prefer either the Zuza potters or a combination of potters from Ochollo *dere*, with the predominant reason that their pots are stronger and therefore last longer (see Chapter 4). When comparing the use-life of Zuza pots with the use-life of other Ochollo *dere* pots, the mean Zuza use-life is 2.1 years and the mean use-life for the Ochollo *dere* pots is 1.5 years. However, the Zuza and Ochollo

dere pots have a median use-life of 1 year. The number of households that prefer either Zuza or a combination of Ochollo potters is almost equal, with only four more households preferring Zuza pots than a combination of Ochollo pots. Therefore, it is interesting that the median use-life is the same, which is mirrored in the opinions of households concerning pottery preference.

The Etello consumers prefer Birbir pots, because they believe Birbir pots last longer than Guyla or Zada pots. The ten Birbir pots used in Etello, of which the majority (70 percent) of the vessels used for cooking, have a mean and median use-life of 2.7 and 1.8 years, respectively. The 40 Guyla and Zada pots (68 percent) used only for cooking, and have a mean and median use-life of 2.1 and 1.4 years, respectively. Therefore, the use-life data agree with the consumer opinions that Birbir pots do last longer and are more durable than Zada or Guyla pots.

Table 7-8: Vessel use-life by functional type and village.

Zuza	Functional Type	n	Mean Use-life	Median Use-life	Range	s. d.
	Cooking	103	2.29	1	0.1-35.0	4.58
	Serving	4	1.75	1.5	1.0-3.0	0.95
	Storage	22	22.12	6	0.1-125.0	30.68
	Transporting	25	2.80	1.9	0.2-20.0	4.04
Etello	Functional Type	n	Mean Use-life	Median Use-life	Range	s. d.
	Cooking	60	2.04	1.9	0.1-10.0	1.91
	Serving	9	6.57	2	0.2-46.0	14.82
	Storage	18	4.28	2.5	0.6-19.7	4.69
	Transporting	6	1.95	1.5	0.1-6.0	2.12
Guyla	Functional Type	n	Mean Use-life	Median Use-life	Range	s. d.
	Cooking	118	2.39	2	0.1-9.0	1.78
	Serving	34	2.95	2	0.1-9.0	2.65
	Storage	48	3.56	2.5	0.1-14.0	3.09
	Transporting	37	3.35	2	0.3-13.0	2.81

The Guyla consumers also prefer Birbir pots to their own Guyla potters' pots, stating that they believe Birbir pots are stronger and last longer than Guyla pots. The use-life data also agree with Guyla consumers' opinions. The 31 Birbir pots, used mostly for cooking, have a mean and median use-life of 3.5 and 3 years, respectively. The mean and median use-life for the 123 Guyla pots, used mostly for cooking, is only 2.1 and 1.6, respectively. All three villages indicate that consumer opinions do parallel the use-life of pots, indicating the importance of the emic perspective concerning the technological and nontechnological aspects of pottery use.

Table 7-9: Vessel volume by functional type and village.

Zuza	Functional Type	n	Mean Volume (liters)	Median Volume (liters)	Range (liters)	s. d.
	Cooking	103	5.50	4.08	0.52-24.42	4.58
	Serving	4	7.10	6.92	0.45-14.13	5.64
	Storage	22	27.16	19.79	5.96-113.04	25.48
	Transporting	25	16.64	16.64	5.57-36.07	7.56
Etello	Functional Type	n	Mean Volume (liters)	Median Volume (liters)	Range (liters)	s. d.
	Cooking	60	7.93	6.79	0.90-22.44	5.21
	Serving	9	12.22	8.18	0.52-33.49	11.11
	Storage	18	35.50	26.51	4.19-124.72	29.91
	Transporting	6	3.44	3.89	0.90-5.57	1.84
Guyla	Functional Type	n	Mean Volume (liters)	Median Volume (liters)	Range (liters)	s. d.
	Cooking	118	10.65	8.18	1.43-91.90	11.05
	Serving	34	8.88	5.72	0.52-49.30	10.07
	Storage	48	33.50	16.37	0.79-150.46	34.7
	Transporting	37	6.87	6.37	0.79-22.44	4.56

Use-life and Cost of Pots

The use-life of pots may influence the cost of the pot, since cheaper pots may reflect the quality of the pot and therefore its longevity. People who purchase more costly pots may be more careful than consumers who purchase less expensive pots. In Zuza, the cost of pots is less than in Guyla or Etello, and Zuza pots have a shorter use-life than the other two villages. This suggests that the more expensive the pot, the longer it will last.

In Zuza and Guyla, the cost of pots does significantly correlate with use-life. The correlation is weak but significant in both villages. However, in Etello as discussed in Chapter 4, consumers purchase their pots through the market. There is no correlation between the cost of pots and use-life in Etello, since Etello consumers purchase all of their vessels at weekly markets and these markets fluctuate in their pricing of ceramic pots (Table 7-10). This market fluctuation caused by seasonal variations (e.g., higher market prices during Easter, Meskal, and Christmas) in the market price of pots is the reason there is no correlation between the cost of Etello pots and use-life. The majority of consumers in Zuza and Guyla purchase their pots directly from the potter's household or from Zuza and Guyla potters at the weekly market, which may result in more consistent prices for the different vessel sizes and types.

Table 7-10: Cost and use-life of pots used in Zada, Guyla, and Etello villages. Correlations in bold are significant at the 0.05 confidence level.

Village	Mean / Median Cost of Pots	Mean / Median Use-life	Correlation: Cost / Use-life of Pots
Zuza	1.5 / 1birr	1.7 / 1	**0.24** (n = 114)
Guyla	4.4 / 2.5 birr	2.9 / 1.7	**0.28** (n = 141)
Etello	3.6 / 2 birr	2.8 / 2	0.05 (n = 78)

Caste Groups

The social status of Gamo society with its strict hierarchy of three castes, *mala*, *mana*, and *degala*, provides a unique opportunity to explore the relationships between vessel frequency and size with household population.

Vessel Types and Population

It is expected that lower castes would have a stronger correlation than higher caste households would between the household vessel type frequency and population. Artisans can only afford to purchase and therefore use a specific amount of vessel types. Specifically, it also is expected that potter households that produce different vessel types may have a negative correlation between the frequency of vessel types and population, since they could make and use many different types.

There is no pattern between caste households living in different villages and their use of vessel types and the number of people per household (Table 7-11). Among the different caste groups, a significant positive correlation between the frequency of vessel types and household population occurs among the Etello *mala* ($r = 0.56$) households. The only negative correlation between household vessel types and

population occurs among the Guyla *degala* households, which is a perfect negative correlation (r = -1.00). The correlation between vessel type and population among the caste households indicates great variation. For instance, potters in Zuza have a strong positive correlation, but the Guyla potters do not. In addition, the outcomes between the two *degala* households from both Guyla and Etello have almost opposite correlation results. Furthermore, the correlation between the mean frequency of vessel types and household population indicate that there is a better relationship in villages without potters (Etello) than villages that have potters (Zuza and Guyla).

Table 7-11: Correlation between frequency of vessel type and household population and mean number of vessel types and household population according to caste. (Bolded cells are significant at the .05 confidence level with 15 degrees of freedom and cells with asterisks indicate a strong correlation).

mala Caste	Zuza	Guyla	Etello
Correlation Vessel Type/Population	0.12	0.28	**0.56**
Mean Number of Vessel Types	6.9	8.14	5.9
Mean Household Population	4.3	6.14	5
mana Caste			
Correlation Vessel Type/Population	0.96*	0.32	-
Mean Number of Vessel Types	6	8.3	-
Mean Household Population	4.3	6.3	-
degala Caste			
Correlation Vessel Type/Population	-	-1.00*	0.97*
Mean Number of Vessel Types	-	8.7	3.7
Mean Household Population	-	4.3	3.6

Vessel Volume

In Chapter 4, it was shown that in the majority of cases the *mala* have a higher frequency of vessels (Figure 5-1), mean number of vessel types (Figure 5-2), and

percentage of vessels used for the processing of high cost foods (Figure 5-3), than the *mana* or *degala* caste households. The mean vessel volume of the different caste households for each village also coincides with the social hierarchy of Gamo society (see Figure 7-1). The *mala* households in Zuza village have a mean of 15.2 liters, compared to only 8.7 liters among the *mana* households. Among Etello village households the mean number of liters is 11.5 in the *mala* caste households, compared to 6.5 liters among the *degala* households. The Guyla *mala* households have a mean of 15.2 liters, whereas the *mana* and *degala* households have 12.4 and 8.9 liters, respectively. The three villages and their mean household vessel volume strongly reflect the Gamo caste hierarchy.

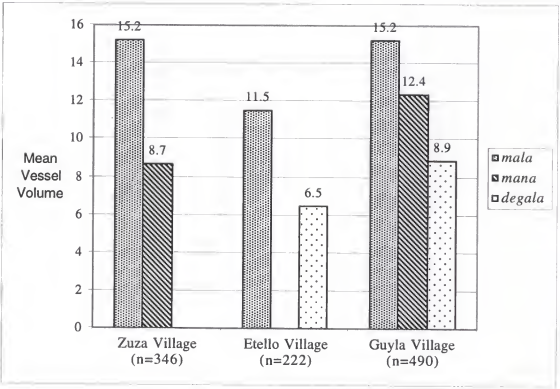

Figure 7-1: Mean vessel volume, according to caste, for the villages of Zuza, Etello, and Guyla (see Appendix A for summary statistics).

Vessel Size and Frequency and Household Population

The relationship between household population and the size and frequency of the ceramic assemblage is explored through the social status of the households in Gamo society. The Gamo caste system influences almost every aspect of household life including the population, economic, and material culture of the household.

Entire life-cycle

I would expect that the cooking and serving vessels would correlate with the household population, especially among the lower caste households because they are not expected to have excess cooking or serving vessels. Since food is eaten in communal serving bowls, it is not surprising that a majority of caste groups have a significant to strong correlation. As discussed in Chapter 5, the Etello *degala* do not use ceramic vessels for serving. The frequency and size of storage vessels may be an indication of the amount of farmland owned, rather than household population. Transporting pots may also not necessarily reflect household population.

Mala household's vessel frequency and size are not expected to correlate with household size because they may own more pots than a household actually needs. The *mala* in Etello are expected to correlate because of their lack of village potters. Etello's *mala* households ($r = 0.65$) have a significant correlation between the frequency of the entire assemblage of vessels and household population. *Mala* households in Etello ($r = 0.68$) have another significant correlation between the mean volume of cooking vessels and household population and a strong correlation in the sum volume of cooking pots. The number of pots that Etello's *mala* households use

and their correlation with household population may be a due to no potters living in the village and *mala* households only using the necessary number of pots that fulfill their daily food processing. The frequency ($r = 0.64$) and sum volume ($r = 0.59$) of serving vessels among Guyla's *mala* are significant with household population. There is no significant or strong relationship among Zuza's *mala* households and their frequency and size of vessels.

The number of artisan caste households for each village (i.e., *mana* and *degala*) is only three and too small to conduct significance tests. The *mana* households in Zuza and Guyla indicate the complexity of the social status and regional differences when correlating household vessels with population. The Zuza *mana* have a strong correlation in every category except for one (frequency of storage vessels), suggesting that these three households use only what is necessarily required for all their household needs. This contrasts with Guyla's *mana* households, which have either a weak to strong negative correlation between their use of vessels and population. This clearly suggests that there are regional differences concerning how *mana* households in Gamo use their household vessels. Guyla's *mana* use considerably larger vessels and more vessel types than the Zuza *mana*. Although Guyla's *mana* households have more people, the mean volume of their vessels is almost twice the mean volume that the Zuza *mana* use (Figure 7.1). The Guyla *mana* needs more storage for agricultural crops, because they own more farmland than the Zuza *mana*.

The *degala* households, in Etello and Guyla, also demonstrate the contrast that occurs among the same caste households that live in different Gamo regions. Etello's *degala* households have a strong correlation between the frequency and sum volume

of the entire assemblage and cooking vessels with household population. As discussed among the Zuza *mana*, Etello's *degala* seem to use only the essential number and size of cooking pots that is required for their household population. Etello's *degala*, as discussed in Chapter 5, use a majority of their pots only for cooking, and have fewer numbers of pots than other caste households. The *degala* households in Etello have a strong negative correlation between the number of storage and transporting pots and their population because these types of pots are not common in their households. This is not surprising because they use few pots for storage due to their lack of farmland. In addition, two of three *degala* households use plastic containers to transport water. Guyla's *degala* households have a strong correlation between the frequency of the entire assemblage ($r = 0.97$), serving ($r = 0.50$), storage ($r = 0.86$), and transporting ($r = 0.86$) pots with their population. They also have a strong correlation ($r = 0.87$) between the sum volume of the entire assemblage and household population.

Primary-use

The relationship between vessel frequency and size should more closely correlate with household population, since the primary-use vessels are purchased and used to fulfill everyday food preparation. The different castes use of their vessels during the primary-use stage and the relationship with household population is similar to the results found in the entire life-cycle analysis. Etello's *mala* households ($r = 0.64$) have a significant relationship between the frequency of primary vessels in the entire assemblage and household size. The Guyla *mala* households have a significant relationship between the frequency ($r = 0.59$) and sum volume ($r = 0.67$) of serving vessels with their household size. Zuza's *mala* do not demonstrate either a significant

or a strong relationship between vessel frequency and size with their household population.

The *mana* households in both villages demonstrate the variation that can occur between members of the same caste living in the same society. As with the entire life-cycle analysis, the Zuza *mana* strongly correlate with a majority of their functional categories and household population (see Appendix D). The reverse occurs among Guyla's *mana* households where the majority of categories indicate a strong negative relationship to household size.

Etello's *degala* households are similar to the entire life-cycle analysis, with a strong frequency of the entire assemblage and cooking vessels to household size. Guyla's *degala* indicate a strong frequency of primary vessels, with the only exception being among the primary cooking vessels. In addition, among the Guyla *degala* every category in the sum volume of primary-use vessels, except for transport vessels, correlates strongly with number of *degala* individuals (see Appendix D).

As discussed in Chapter 5, the Zuza households rely more on wood serving bowls than on ceramic vessels, except for the *mana* households. Therefore, it is interesting that both caste households in Zuza have either a significant or a strong correlation with household population and frequency of serving vessels. The *mana* households all use serving vessels and eight of the 17 *mala* households use ceramic serving vessels. These eight Zuza *mala* households have a significant correlation (r = 0.77) between the frequency of primary-use serving vessels and household size. However, there is not a significant correlation between the mean or sum volume of primary-use serving vessels with household population.

Reuse

It is not expected that the caste households would express a relationship between reused vessels and household size. The only significant correlation that occurs is between the frequency ($r = 0.61$) and mean volume ($r = 0.67$) of Zuza *mala* cooking vessels with household population. Guyla and Etello's *mala* households fail to have any significant or strong correlation with frequency of vessels and household size. The only significant correlation between the sum volume and household population occurs among the Etello's *mala* reuse of storage ($r = 0.51$) and transporting ($r = 0.55$) vessels.

The *mana* households living in Zuza and Guyla demonstrate a contrast concerning the relationship between the ceramic assemblage and household size. The Zuza *mana* households continue to have strong relationships among its vessels and household population frequency ($r = 0.92$) and mean ($r = 0.98$) and sum volume ($r = 0.95$) of all vessels and household population, as well as frequency ($r = 0.88$) and mean ($r = 0.99$) and sum volume of cooking, storage and serving vessels (see Appendix D). Guyla's *mana* households ($r = -0.75$) have a strong negative correlation between the frequency of cooking vessels and household population, but have a strong positive correlation ($r = 0.75$) between the number of serving vessels and household size. Guyla's *mana* households have a strong correlation between the mean ($r = 0.95$) and sum ($r = 0.99$) volume of all functional vessels. Guyla's *mana* households indicate a strong negative correlation ($r = -0.69$) between the mean volume of serving vessels and the *mana* population. In addition, Guyla's *mana* households have a strong

negative correlation (r = -0.51) between the sum volume of cooking vessels and household size.

The *degala* households in both Guyla and Etello indicate that reuse vessels do not correlate well with household size. The majority of relationships indicate a weak to somewhat strong negative correlation between the frequency and size of pots with household size (see Appendix D).

Discard

As expected, there are not many significant relationships between the frequency and size of discarded pots with household size. Among the *mala* households, only the Guyla *mala* have a significant correlation between the frequency (r = 0.58) and sum volume (r = 0.65) of discarded cooking pots with household population (Table 7-12). The only strong positive correlation that occurs among *mana* households is Guyla's *mana* frequency (r = 0.50) of discarded cooking pots and their household size. All the other associations between discarded vessels and the *mana* population are weak or strongly negative. Etello's *degala* use of discarded vessels indicates a strong correlation between the entire assemblage and cooking vessels with household size. Guyla's *degala* households indicate a strong negative correlation between discarded vessels that make up the entire assemblage and discarded cooking pots. As discussed in the above village discard section, once pots reach the discard stage their association with household population is dramatically different from the entire life-cycle analysis.

Use-life and Social Status

The social status of a household and its use of ceramic vessels will have a direct relationship to vessel use-life. The Gamo society with their strict social hierarchy provides an excellent example for understanding the relationship between a household's status and vessel use-life.

Table 7-12: Summary of significant correlations (*r*) between village population and the frequency and size of different functional vessels at the 0.05 confidence level. (ZM = Zuza *mala*, Zm = Zuza *mana*, EM = Etello *mala*, ED = Etello *degala*, GM = Guyla *mala*, Gm = Guyla *mana*, GD = Guyla *degala*, F = Frequency, M = Mean Volume, and S = Sum Volume).

	All Functions	Cooking	Serving	Storage	Transportation
Entire Life-Cycle	EMF,	EMM	GMF, GMS	-	-
Primary-Use	EMF	-	GMF, GMS	-	-
Reuse	-	ZMS	-	EMM	EMM
Discard	-	GMF, GMS	-	-	-

Vessel use-life, function, and volume

We would expect that since lower caste households have fewer vessels than the higher caste households, the lower caste households would have to use their vessels with more frequency causing them to have a shorter use-life. With Zuza as the only exception, Etello and Guyla *mana* and *degala* caste households have vessels that have a shorter use-life than the *mala* households (Table 7-13). The lower caste households use smaller vessels, but vessel frequency and their repeated use seems to be more of a determinant factor concerning vessel use-life.

Table 7-13: Vessel use-life and volume by functional type according to village caste.

	Functional Type	n	Mean Use-life	Median Use-life	s. d.	Mean Volume (liters)	Median Volume (liters)	s. d.
Zuza *mala*	Cooking	96	2.29	1	4.70	5.60	4.14	4.68
	Transporting	21	3.20	2	4.29	16.91	14.77	7.77
Zuza *mana*	Cooking	6	2.65	1.95	2.67	4.36	3.05	2.95
	Transporting	4	0.72	0.4	0.78	15.23	14.86	7.23
	Functional Type	n	Mean Use-life	Median Use-life	s. d.	Mean Volume (liters)	Median Volume (liters)	s. d.
Etello *mala*	Cooking	48	2.14	1.9	2.01	8.09	6.80	5.69
Etello *degala*	Cooking	12	1.61	1.5	1.38	7.29	6.79	2.53
	Functional Type	n	Mean Use-life	Median Use-life	s. d.	Mean Volume (liters)	Median Volume (liters)	s. d.
Guyla *mala*	Cooking	90	2.66	2	1.89	10.83	8.18	11.28
	Serving	26	3.21	2.5	2.78	9.39	5.49	11.30
	Storage	35	4.02	3	3.25	37.02	22.44	38.12
	Transporting	33	3.57	2.8	2.9	6.99	6.79	4.69
Guyla *mana*	Cooking	10	1.64	1.25	1.15	6.95	6.59	4.21
	Serving	6	2.16	0.95	2.53	5.68	5.50	2.92
	Storage	8	2.88	2.3	2.78	25.46	11.31	24.92
	Transporting	1	2	2	-	2.57	2.57	-
Guyla *degala*	Cooking	17	1.5	1	0.85	11.97	7.70	12.80
	Serving	2	1.95	1.95	0.07	11.78	11.78	5.38
	Storage	5	1.46	2	0.74	21.66	15.59	17.21
	Transporting	3	1.4	1.6	0.52	6.98	5.57	3.70

Use-life and cost of Pots

Lower caste households use their vessels more often and purchase cheaper pots. Therefore, lower caste pots have a shorter use-life than do higher caste households (Table 7-14). In Guyla and Etello, the *mala* caste has more expensive pots than the *degala* households (see Chapter 4). *Mana* households are not analyzed in Zuza and Guyla, because the *mana* household's use pots that they have manufactured.

In addition, since Zuza has only *mala* and *mana* castes it is not possible to make a comparison. In Guyla and Etello, the *mala* caste spend more on their pots (which have a longer use-life), than the *degala* household pots.

Table 7-14: Cost and use-life of pots used by village caste. Correlations in bold are significant at the 0.05 confidence level.

Village and Caste	Mean / Median Cost of Pots	Mean / Median Use-life	Correlation: Cost / Use-life of Pots
Guyla *mala*	4.6 / 2.7 birr	3.0 / 2	**0.28** (n = 122)
Guyla *degala*	3.2 / 2 birr	1.2 / 0.9	0.08 (n = 20)
Etello *mala*	3.7 / 2 birr	3.0 / 1.9	0.04 (n = 71)
Etello *degala*	2.3 / 2 birr	1 / 0.5	0.43 (n = 7)

Social status and how it reflects through the household ceramic assemblage has indicated that archaeologists may be able to explore status, household population, occupation span, and site function. The Gamo indicate that differences do occur between caste households within one society regarding how household population correlates to vessel use-life. Therefore, the social status cannot be explored by itself, but must be placed in the proper context of where, who, and how pots are manufactured, distributed, and used in the society.

Economic Ranks

The economic wealth of a household in Gamo society may affect the relationship between vessel frequency and size with household population. In addition,

the analysis of vessel use-life and its relationship with household wealth furthers our understanding between household ceramic assemblages and the economic component of society.

Vessel Type and Population

Poorer ranked households have a stronger correlation than other households between vessel type frequency and population because they can only afford and therefore use a limited number of types (Table 7-15). There is a significant correlation among Etello's second-ranked households, but Etello's third-ranked only has four households making the sample size too small for a reliable significance test. Etello's first-ranked has a very weak correlation between household vessel type and population, as do the other ranked households in Zuza and Guyla.

Table 7-15: Correlations between the frequency of vessel type and household population and mean number of vessel types and household population according to economic rank caste. (Bolded cells are significant at the 0.05 confidence level).

1st Economic Rank	Zuza	Guyla	Etello
Correlation Vessel Type/Population	0.19	-0.11	0.11
Mean Number of Vessel Types	7.4	8.8	7.2
Mean Household Population	6	7.3	6.4
2nd Economic Rank			
Correlation Vessel Type/Population	0.14	0.25	**0.65**
Mean Number of Vessel Types	6.4	7.8	5.4
Mean Household Population	5.4	5.1	4.5
3rd Economic Rank			
Correlation Vessel Type/Population	0.00	-	0.68
Mean Number of Vessel Types	7.2	-	4.2
Mean Household Population	2.2	-	3.7

Vessel Volume

Previously in Chapter 5 it was shown that in the majority of cases the wealthier households have a higher frequency of vessels (Figure 5-4), mean number of vessel types (Figure 5-5), and percentage of vessels used for the processing of high cost foods (Figure 5-6) than the poorer households. The mean vessel volume between the ranked households in the three villages does correspond to their economic ranking. Figure 7-2 indicates the average vessel volume according to economic rank. The highest ranked households in Zuza have a vessel volume mean of 17.9 liters, whereas the second-ranked mean is 13.9 liters and the lowest economic ranked households have a vessel volume mean of 11.7 liters. The vessel volume mean for the highest ranked households in Etello is 11.5 liters and the second-ranked households have a mean of 11.8 liters and as expected the poorest Etello households have the lowest mean of 6.6 liters. The vessel volume means do not dramatically differ among the highest and second-ranked households in Guyla with means of 14.6 and 13.8 liters, respectively. The different household economic wealth rankings and their corresponding mean vessel volume is a reflection of wealthier households having more people (Table 7-15), but also more economic wealth than poorer households.

Vessel Size and Frequency and Household Population

The relationship between household population and the size and frequency of the ceramic assemblage is investigated through the economic wealth of households in Gamo society. The factors that determine the economic wealth of households may influence the size and frequency of pots and how people use their household vessels.

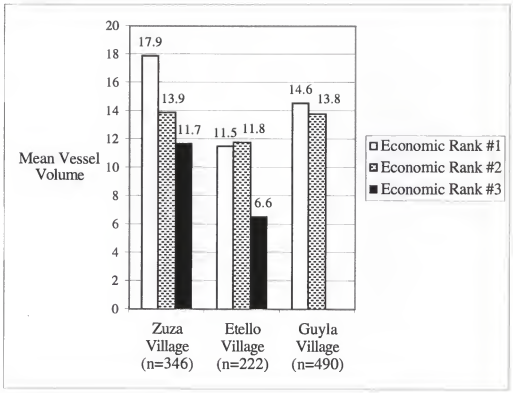

Figure 7-2: Mean vessel volume, according to economic rank, for the villages of Zuza, Etello, and Guyla (see Appendix B for summary statistics).

Entire life-cycle

I would expect that the wealthiest households would not indicate a strong relationship between the frequency and size of pots with household population because these households may own more pots than the household size requires in the processing of household foods. The wealthier households have more land to farm and therefore need more vessels to store their surplus crops. In addition, several of these households have been *Halakas* in the past and therefore purchased excess ceramic vessels to process beer and food for the two *Halaka* feasts (see Feasting section below). Therefore, it is not expected that the frequency and size of cooking, serving,

storage, and transporting vessels would correlate with household population among the wealthiest households. However, it is expected that the poorer households would have strong to significant correlations between the frequency and size of vessels to household population because these households are expected to use only what the household actually needs. There would not be any surplus vessels among the poorer ranked households.

The wealthiest households are not expected to show relationships between their household's vessel frequency and size with household size. However, throughout the three villages, the wealthiest households correlate more than the other households. The wealthiest households have a strong correlation between the mean volume of the entire assemblage ($r = 0.70$) and household size in Guyla. In addition, Guyla's households also indicate a strong relationship between the sum volume of serving vessels ($r = 0.73$) and household population. The frequency ($r = 0.53$) and sum volume ($r = 0.70$) of serving vessels demonstrate a strong relationship to household size among Zuza's wealthiest households (Table 7-16). The wealthiest households in Etello indicate that cooking vessels correlate more than serving vessels to household population. There is a significant relationship ($r = 0.97$) between the mean volume of cooking vessels with household size. Furthermore, Etello's wealthiest households show a strong correlation between the frequency of the entire assemblage ($r = 0.55$) and sum volume ($r = 0.50$) of cooking vessels with household size. The wealthiest households in all three villages demonstrate that the expectation of a surplus ceramic assemblage does not affect the relationship with household size.

I would expect that as the wealth of the household decreases, the stronger the relationships will be between a household's ceramic assemblage and population. However, Etello's second-ranked households are the only group that have a significant relationship between the entire assemblage ($r = 0.69$), frequency of storage vessels ($r = 0.68$), and the mean sum ($r = 0.71$) of cooking vessels with their household size. Zuza's second-ranked households indicate a strong correlation between the frequency ($r = 0.53$) and sum volume ($r = 0.58$) of the entire assemblage with household size. This economic ranking in Zuza also has a strong correlation between the mean volume of cooking pots ($r = 0.55$) with household size. Guyla's second-ranked households do not show either a strong positive or negative relationship between vessel frequency and size with their household population. Etello demonstrates that a village without potters may provide the strongest relationship between household vessels and population (Appendix D).

Unexpectedly the poorest households do not have many significant correlations between household pots and size. The poorest households in Zuza indicate a strong negative correlation between the frequency of storage vessels ($r = -0.63$) and household size. Etello's poorest households demonstrate a strong correlation concerning the frequency of the entire assemblage ($r = 0.84$). In addition, there is a strong relationship between the frequency ($r = 0.77$) and sum volume ($r = 0.68$) of cooking vessels with household size. The wealth criteria did not include a third ranking for Guyla's households. Thus, every economic ranking in Etello demonstrates either a significant or strong relationship between vessel frequency and size and

household population indicating that the relationship between people and their pots is more closely connected than in Zuza or Guyla.

Primary-use

The primary-use vessels among the different economic ranks should reveal correlations between household size and vessel frequency and size. The primary-use vessels represent the only stage that should directly relate to the actual subsistence needs of a household. The only significant correlation that occurs among the wealthiest households' primary-use vessels is the sum volume of serving vessels used in Zuza and household size. Strong relationships occur between Zuza's frequency and mean volume of serving vessels and the frequency of storage vessels and household population. Etello's first-ranked households indicate a strong relationship between the frequency of all primary-use vessels ($r = 0.55$) and a strong negative correlation between the frequency of transport vessels ($r = -0.62$) with household size. Etello's lack of potters suggests why there is a strong correlation between household population and the number of primary-use pots, as there is a close relationship between what a household needs and uses. The strong negative relationship between population and frequency of transport vessels occurs for two reasons. First, Etello does not need to rely on a larger number of transport vessels because the Itsamighty River is adjacent to many of the households. Secondly, these households rely more on plastic water containers than they do on ceramic vessels to transport their water. Guyla's wealthiest households fail to demonstrate a strong positive or negative relationship among their primary-use vessels.

The only significant correlation occurring among the second-ranked households is among Etello's frequency of all primary-use vessels ($r = 0.69$) and household size. This is the only significant or strong correlation among all second ranked households in each of the three villages.

The poorest households of Zuza and Etello indicate a strong negative correlation occurring only among Zuza's frequency of all primary-use vessels ($r = -0.52$) and Etello's mean volume of all primary-use vessels ($r = -0.65$) and cooking vessels ($r = -0.72$) with household size. The occurrence of strong negative correlations in Zuza and Etello's poorest households is a result of using large *ottos* (cooking, storing, and transporting jars) and *tsaros* (cooking jars) for a majority of their household needs. Therefore, the household population does not correlate with the large volumes of these two types of pots.

Reuse

The reuse of vessels among the different economic ranks demonstrates an interesting development with a larger number of significant results than what was found among the entire life-cycle and primary-use analyses. Thus, when households are ranked according to wealth attributes, the reuse vessels seem to be a strong indicator of household population. This reflects the poorer household's need to reuse more vessels because they can not afford new ones and wealthier households having more types of pots that can be reused.

Among the wealthiest households of Zuza, there is a strong relationship between household size and the frequency of reused cooking vessels ($r = 0.85$). Significant relationships occur among Zuza's wealthiest households between the mean

volume of reused cooking pots ($r = 0.94$) and sum volume of reused cooking pots ($r = 0.93$). Zuza's wealthiest households also have a strong negative correlation between the frequency of transport vessels ($r = -0.86$) and household size. Among Guyla and Etello's wealthiest households there are no strong or significant correlations occurring between their reuse vessels and population.

Guyla's second rank households have a significant negative relationship between the sum volume of reused cooking vessels ($r = -0.67$) and population. A strong correlation occurs among Etello's second-ranked households between the mean volume of reused cooking vessels ($r = 0.59$) and household size. Zuza's second-ranked households fail to indicate a strong or significant relationship.

The poorest households of Zuza have a significant relationship between the frequency ($r = 0.73$) and sum volume ($r = 0.74$) of reused cooking pots and household size. This group of households also indicate a significant negative correlation between the frequency of reused storage vessels ($r = -0.62$) and the number of people. The only strong correlation occurring among Etello's poorest households is a negative correlation between the mean volume of vessels ($r = -0.55$) reused for all functions and the number of people.

Discard

The number of pots among the different functional categories that can be used in the discard analysis drops considerably because of the low number of discarded pots in the different economic ranked households. However, several significant results occur within the second-ranked households of Zuza and Etello. This analysis indicates

that among the second-ranked households there is a relationship between number of people in a household and the occurrence of broken discarded vessels.

Significant results occur among Etello's second-ranked households and their frequency ($r = 0.90$) and the sum volume ($r = 0.63$) of storage vessels (Table 7-16). Etello's second-ranked households have a strong relationship between the number of discarded pots of all functions ($r = 0.54$) with number of people. Zuza's second-ranked households have a strong relationship between the frequency of discarded vessels of all functions ($r = 0.72$) and cooking vessels ($r = 0.70$) with household size.

Table 7-16: Summary of significant correlations (r) between village population and the frequency and size of different functional vessels at the 0.05 confidence level. (Z1 = Zuza Rank 1, Z2 = Zuza Rank 2, Z3 = Zuza Rank 3, E1 = Etello Rank 1, E2 = Etello Rank 2, E3 = Etello Rank 3, G1 = Guyla Rank 1, G2 = Guyla Rank 2, F = Frequency, M = Mean Volume, and S = Sum Volume).

	All Functions	Cooking	Serving	Storage	Transportation
Entire Life-Cycle	E2M	E1F, E2M	-	-	-
Primary-use	-	E2F	Z1S	-	-
Reuse	-	Z1M, Z1S Z3F, Z3S	-	Z3F	-
Discard	-	-	-	E2F, E2S	-

Use-life and Economic Wealth

The economic wealth of a household can have a direct effect on vessel use-life. Poorer households have a limited ceramic assemblage and therefore must use their vessels with more frequency than wealthier households. The relationship between the wealth of a household and the amount people spend for pots may have an effect on vessel use-life.

Vessel use-life, function, and volume

Household economic wealth in association with vessel function, volume, or frequency of use, affects the use-life of vessels. I expect that storage vessels have a longer use-life in all of the economic ranks. This expectation tends to be true in all of the economic ranks from the three villages, with the only exception among the wealthiest households in Guyla where serving and transporting vessels have a longer use-life than storage vessels (Table 7-17). Storage vessels also tend to be larger than most of the other vessels, which supports the view that larger vessels are used with less frequency and therefore have a longer use-life than smaller, more frequently used vessels (Longacre 1985; Tani 1994) (Table 7-17).

Since the poorer households have fewer pots per household (see Chapter 5), I expected that their frequency of use would be greater than in the richer households. Thus, the vessel use-life in poorer households would be shorter than in the richer households. The third economic rank or poorer households do have shorter use-life than the richer households, with the only exception occurring among Zuza's third-ranked households in their transporting vessels. Therefore, frequency of vessels per household, which causes vessels to be repeatedly used more often, has a direct effect on vessel use-life, which corresponds with a household's economic rank.

Use-life and cost of pots

The purchase price of pots may have an effect on the use-life of vessels. The poorer households purchase cheaper pots than the wealthier households do, the only exception occurring in Etello. The poorer households may be more careful with their pots, since they can not afford to replace their pots. There are two contributing factors

Table 7-17: Vessel use-life and volume by functional type by economic rank.

Zuza	Functional Type	n	Mean Use-life	Median Use-life	s. d.	Mean Volume (l)	Median Volume (l)	s. d.
First Economic Rank	Cooking	35	2.2	1	3.12	6.16	4.19	5.61
	Serving	3	2	2	1.00	7.49	7.89	6.84
	Storage	9	22.3	2	41.73	29.76	24.42	21.01
	Transporting	10	4.2	2	5.79	14.98	13.76	7.98
Second Economic Rank	Cooking	31	2.8	1.8	6.15	6.23	4.85	4.41
	Serving	-	-	-	-	-	-	-
	Storage	7	26.7	20	20.98	30.09	17.15	37.24
	Transporting	6	0.9	0.9	0.62	14.04	14.45	1.64
Third Economic Rank	Cooking	37	2.0	1	4.3	4.26	3.31	3.33
	Serving	1	1	1	-	1	1	-
	Storage	6	16.5	4.4	23.87	19.84	12.75	16.36
	Transporting	9	2.5	1.9	2.36	20.21	22.43	8.69
Etello	Functional Type	n	Mean Use-life	Median Use-life	s. d.	Mean Volume (l)	Median Volume (l)	s. d.
First Economic Rank	Cooking	13	2.3	1.9	1.60	8.64	5.57	7.16
	Serving	4	13	2.5	22.04	7.30	6.66	5.24
	Storage	3	7.9	3	10.26	31.83	26.51	11.08
	Transporting	2	4	4	2.82	3.58	3.58	2.81
Second Economic Rank	Cooking	33	2	1.9	2.04	8.15	7.23	5.18
	Serving	5	1.4	2	0.81	16.16	12.11	13.52
	Storage	15	3.5	2	2.88	36.24	26.51	32.64
	Transporting	4	0.9	0.8	0.80	3.38	3.89	1.73
Third Economic Rank	Cooking	14	1.9	1.5	1.94	6.75	6.58	2.72
	Serving	-	-	-	-	-	-	-
	Storage	-	-	-	-	-	-	-
	Transporting	-	-	-	-	-	-	-
Guyla	Functional Type	n	Mean Use-life	Median Use-life	s. d.	Mean Volume (l)	Median Volume (l)	s. d.
First Economic Rank	Cooking	45	3.2	2.4	2.16	12.29	9.20	13.27
	Serving	11	4.5	3	3.17	10.28	8.89	8.89
	Storage	22	3.9	2.5	14.20	42.16	26.74	39.36
	Transporting	19	4.4	3	3.24	7.78	7.23	4.30
Second Economic Rank	Cooking	73	1.9	1.9	1.32	9.64	7.23	9.38
	Serving	23	2.2	1	4.25	8.21	4.51	10.72
	Storage	26	3.2	2.5	5.80	26.16	11.86	28.98
	Transporting	18	2.2	1.9	1.71	5.91	5.21	4.76

as to why poor households have shorter vessel use-life. First, the poorer households use their pots with more frequency because they have fewer pots to use (see Chapter 5); and secondly, they purchase those of cheaper quality so their use-life is shortened. The wealthier households in both Etello and Guyla enjoy longer vessel use-life than the poorer households. However, in Zuza, the median use-life for all three economic ranks is the same, but the mean use-life is greater among the wealthier households. In addition, the correlation between the cost and use-life of pots is significant in the majority of economic ranks, with Etello's second and third and Guyla's second economic ranks (Table 7-18). Thus, the cost of pots in the context of a household's economic rank does indicate that it influences the use-life of vessels.

Table 7-18: Cost and use-life of pots used by village economic ranks. Correlations in bold are significant at the 0.05 confidence level.

Zuza	Mean / Median Cost of Pots	Mean / Median Use-life	Correlation: Cost / Use-life of Pots
First Economic Rank	1.9 / 1.5 birr	2 / 1	0.25 (n = 45)
Second Economic Rank	1.1 / 1 birr	1.5 / 1	-0.08 (n = 27)
Third Economic Rank	1.2 / 1 birr	1.6 / 1	0.24 (n = 42)

Etello	Mean / Median Cost of Pots	Mean / Median Use-life	Correlation: Cost / Use-life of Pots
First Economic Rank	2.3 / 1 birr	6 / 1.9	-0.19 (n = 16)
Second Economic Rank	4.2 / 2.2 birr	2.2 / 1.9	**0.39** (n = 53)
Third Economic Rank	2.5 / 2 birr	1.5 / 0.5	**0.85** (n = 9)

Guyla	Mean / Median Cost of Pots	Mean / Median Use-life	Correlation: Cost / Use-life of Pots
First Economic Rank	5.2 / 3 birr	3.6 / 3	0.21 (n = 73)
Second Economic Rank	3.5 / 2 birr	3.5 / 1.9	**0.39** (n = 69)

The wealth of a household and its corresponding use of vessels suggests that household wealth influences the relationships between vessel frequency and size with household population. Furthermore, the use-life of pots is partly conditioned by the economic wealth of a household because this affects the frequency and type of use and what types of vessels people purchase.

Feasting and Vessel Frequency and Size

Wealthy members of the *mala* caste usually control feasting in Gamo society. However, in certain parts of Gamo the *mana* and *degala* caste members have their own *Halaka*s and produce their own feast, but not on the grand scale as the *mala Halaka*. The *mana* and *degala* usually request for food and other items needed to hold a feast from their *mala* patron. There are no *degala Halaka*s among the Etello and Guyla *degala* and Guyla and Zuza *mana* also do not conduct *Halaka* ceremonies. The *mala Halaka* produces two feasts, one at his household and the other in the *dubusha* (see Chapter 2 for details). He must have enough food and beer for his *dere* and this entails having enough ceramic containers to cook, serve, store for fermentation of beer, and transport. The feast encompasses four days of providing wheat beer and Gamo foods. Processing the beer requires large vessels for the fermentation. The feast is required for the year that the man is a *Halaka*. Therefore, I expect the households that are led by a former or present *Halaka* will have a higher frequency and larger vessels than the non-*Halaka* households. One reason that *mala* caste households have a large mean vessel volume is that some of these households are former *Halaka* households.

I would expect that *Halaka* households would have a higher frequency of large storage jars for the fermentation of wheat beer. Zuza *Halaka* households confirm the hypothesis, with an average of 4 *batsa*s in each of the two households inventoried, which compares to only 1.5 *batsa*s for the remaining 15 *mala* households. Etello *Halaka* households have almost twice the number of *batsa*s of other *mala* households, with 1.5 *batsa*s per *Halaka* household to only 0.8 *batsa* per *mala* household. Guyla *Halaka* households have a mean of four *batsa*s per household to 2.2 *batsa* per household inventoried among the other *mala* households.

In addition, I would expect *Halaka* households to have a larger number of gourds for drinking beer than do non-*Halaka* households. Again Zuza *Halaka* households confirm the hypothesis with a mean of 20 gourds inventoried from the 2 households which compares to only 5.7 gourds for the remaining 15 Zuza *mala* households. Etello *Halaka* households have a mean of seven gourds per household compared to a mean of 3.2 gourds for the other 15 *mala* households. However, in the village of Guyla where gourds are not commonly used, the *Halaka* households have a mean of 1.5 gourds per households compared to 1.7 gourds for the remaining 12 *mala* households.

I inventoried two *Halaka* households in Zuza and they have a mean vessel volume of 18.71 liters, which is 4.35 liters more than recorded in the other Zuza *mala* households. Two *Halaka* households were inventoried in Etello and they have a mean vessel volume of 12.26 which is only 0.9 liters more than the other 15 *mala* households. In addition, the Guyla *Halaka* households only have 0.14 mean liters more than the mean vessel volume of the other *mala* households.

Summary and Conclusions

The household ceramic assemblages among the Gamo in many instances correlate with household population. However, this relationship between ceramics and household population is affected by socioeconomic status. The use-life of Gamo vessels is influenced by a number of factors, including manufacturing techniques and materials, vessel function, vessel size, frequency of use, household social status, household economic wealth, and vessel cost. Feasting in Gamo society also influences a household's ceramic assemblage. Thus, the procurement, production, distribution, and use of ceramics, as well as the social and economic make-up of a household, influences the household's interaction with its ceramic assemblage and the longevity of pots.

The number and volume of household ceramics have the potential to reveal a household's population, which is important for archaeologists concerned with demography. A correlation between ceramic frequency and population is strongest in non-pottery-producing villages. There have not been any previous studies examining the relationship between the frequency of vessel types and population. The Gamo analyses indicate that a significant correlation between the frequency of vessel types and household size occurs in the non-pottery-producing village of Etello, including a significant and strong relationship among the *mala* and *degala* castes. In addition, the second and third economic ranks in Etello demonstrate a significant relationship between the frequency of vessel types and household size. Since Etello is a village without potters, it provides for an interesting pattern for villages that rely on others to produce pots. This suggests that the people of Etello use only the necessary vessel

types for food preparation according to their household size. The villages of Zuza and Guyla have potters living in their village, with consumers purchasing the majority of their household pots from their village potters (see Chapter 4). Further research in Ethiopia should determine if non-pottery-producing villages are better examples for demonstrating the relationship between household ceramics and population in ethnoarchaeological and archaeological contexts.

Other researchers have addressed the difference between pottery-producing villages and non-pottery-producing villages in terms of the number of pots per household. Nelson (1991:171) and DeBoer and Lathrop (1979:124) found that the stockpiling of pots by consumers is one reason why the frequency of pots does not correlate with household size. Pottery-producing villages and villages that are allies with a pottery-producing village stockpile less than a village that does not have potters nearby (Tani 1994:57). However, my Gamo data indicate that Etello, a village without potters, has fewer pots than either Zuza or Guyla, which have potters living in their villages. Stockpiling is not needed among the Etello consumers because they can travel to the nearby weekly market to purchase their pots, but this makes it more difficult to replace their broken pots than it does for consumers living in Zuza or Guyla.

The classic study by Turner and Lofgren (1966) was the first to look at the relationship between vessel size and household size in the American Southwest. Their archaeological study compared the volumes of serving bowls, cooking jars, and ladles that could indicate differences in the number of people served at a meal through time. The results from their 542 vessels indicated an increase in vessel volume from AD 500

to 1900, except for the period following the Great Drought. They believed that cooking jars over 8 liters were used for large gatherings and co-occur with the development of the ceremonial kiva construction (Turner and Lofgren 1966:125-127). In contrast, Nelson's (1981) ethnoarchaeological study tested Turner and Lofgren's (1966) analysis by analyzing the vessel volume from 51 households in the village of San Mateo Ixtatan in the Maya Highlands of Guatemala. Nelson's (1981:126) analysis indicated that there is a significant relationship between vessel size and household population, but only when controlling for household status and wealth.

However, Tani's (1994) ethnoarchaeological study in Dangtalan village among the Kalinga reinvigorates the original hypothesis set forth by Turner and Lofgren (1966) by demonstrating a significant correlation between the mean volume of regular-sized cooking vessels and household size. Tani contends that the reason Nelson's (1981) data did not correlate is due to the food processing techniques used by the Maya. The Maya preprocess corn by soaking and the volume of the cooking vessel reflects only the amount of water and corn, but not the amount of corn consumed. Furthermore, the Maya prepare meals made for the entire day, not individual meals consumed at each meal. Therefore, the volume of the cooking vessel does not correspond to the number of people eating from the pots (Tani 1994:55-56). Among the Kalinga, food usually is prepared for every meal and they only use one pot for rice cooking and another vessel for vegetable/meat cooking (Skibo 1992:67). However, when correlating the number of pots with household size among the Kalinga, both Longacre (1991) and Tani (1994) did not find a significant correlation.

The Gamo study of the vessel size and household population indicates a contrast between the village of Etello, a village without potters, and the villages of Zuza and Guyla where villages reside. Etello has a significant correlation between the size of cooking vessels and household population. Zuza and Guyla have significant correlations between the size of their serving vessels with household population in the entire vessel and primary-use analyses. During the reuse stage, Etello has a significant relationship between the size of storage vessels and household population. Furthermore, Zuza and Guyla's size of reused cooking vessels and their association with household size indicate a contrast between the two villages, because of their occupational differences. As the life-cycle continues from primary to discard, the number of significant relationships decreases and the relationships that do occur are not consistent with the entire assemblage analysis.

Tani (1994) also found a significant relationship between household size and number of broken discarded pots of all types. However, in Gamo only when controlling for social status and economic wealth was there a significant correlation between the household size and the number of discarded broken pots in any of the three villages. The *mala* households in Guyla have a significant correlation between the frequency of discarded pots and household size. The second economic wealth households in Zuza and Etello indicated significant relationships between the frequency of discarded pots and the frequency and sum volume of storage vessels.

The socioeconomic status of a household may affect the relationship between vessel frequency and size and household population. Nelson's (1981) analysis of the Mayan village of San Mateo Ixtatan is the only study that has looked into social status

and economic wealth and how this affects the relationships between vessel size and household population. The Gamo analysis concerning the social status of household vessels and population indicate that regional differences occur among the same caste group. The caste analysis demonstrates a reduction in the number of strong and significant relationships occurring as the analysis continues through the life-cycle. Although the artisan caste groups do indicate strong relationship in a number of categories, further research is needed to address the significance of the relationships. The problem in Gamo is that the number of artisan households in each village usually is small. Therefore, future research will need to locate and focus on villages that have a larger group of households that belong to the *mana* and *degala* castes.

The economic wealth analysis of household assemblages and population demonstrates that strong to significant relationships do occur in each ranked group. The economic rank analysis indicates the potential for understanding how vessel function relates to vessel frequency and size to household population. A surprising feature in this analysis is that during the reuse stage more significant correlations occur than in the entire life-cycle and primary-use analyses. This suggests that poorer households need to reuse more vessels to fulfill their household food preparation and cannot afford new ones. Furthermore, the wealthier households are reusing their vessels because they have more types to reuse and need the vessels for storing surplus crops.

Understanding the use-life of pottery vessels is important to archaeologists attempting to decipher site function, population size, occupational duration, social status and economic wealth. Use-life research has been conducted by a number of

researchers, who have indicated that a vessel's longevity is related to production techniques and materials, frequency of use, vessel function and size, and replacement costs (Bankes 1985; Birmingham 1975; David 1972; David and Hennig 1972; DeBoer 1974; Deal 1998; Foster 1960; Longacre 1985; Nelson 1991; Okpopo 1987; Pastron 1974; Rice 1987; Shott 1996; Stanilawski 1978; Tani 1994). The Gamo analysis indicates that when vessel function is associated with vessel size, larger vessels used for storage do have a longer use-life than other vessels. However, the vessel types do not follow a predictable trend concerning vessel size and use-life because each village and household use many of its vessel types for multiple functions, thereby confusing the picture. This indicates the importance of archaeologists to attempt to understand the actual uses of each vessel by its household context, morphological, and use-alteration attributes.

The Gamo use-life analysis also indicates that consumers are knowledgeable about their societies' ceramic production methods. The Gamo consumer's opinions concerning which villages and/or regions manufacture the strongest vessels correlate with the vessel use-life analysis. Therefore, the manufacturing and materials that potters use seem to be an important component concerning a vessel's longevity.

The social and economic analyses of Gamo vessel use-life suggests that due to the lower status and poorer households having fewer pots they must use them with more frequency causing a reduced use-life than the higher status and wealthier households. In addition, the cost of the vessel influences its use-life, with higher caste households and wealthier households purchasing more expensive vessels, which last longer than those of lower caste households and poorer households. This may either be

due to lower caste and poorer households using their vessels more often and purchasing cheaper vessels, which causes them to break faster than those households of high status and wealth.

Trostel's (1994) ethnoarchaeological study of a Kalinga community found that vessel volume (i.e., both ceramic and metal containers) was the strongest predictor of household economic wealth. Caste and economic rank households in Gamo demonstrate that ceramic vessel volume does correlate with household social status and economic wealth. The mean volume of Gamo vessels clearly indicates that higher caste households and wealthier households have larger vessels than lower caste and poorer households.

Large vessels used during special feasting ceremonies are common in a number of societies (Deal 1998; DeBoer and Lathrap 1979; Longacre 1985; Nelson 1981, 1991; Pastron 1974; Pauketat and Emerson 1991:923). Since the *Halaka* households in Gamo conduct feasts for their *dere*, they have a higher frequency of large storage vessels (*batsa*s) and gourds for the preparation and drinking of beer. However, only in Zuza did the *Halaka* households have a considerably larger mean vessel volume than the other non-*Halaka mala* households.

The complexity of household ceramics, from the procurement of clays and tempers to the eventual discard of the vessel, is determined partly by the village's social and economic standing in Gamo society. This analysis indicates that a holistic approach is required when attempting to use household ceramics to explore the many dimensions of a society's population, use-life, social status, and economic wealth.

CHAPTER 8
GAMO POTTERY AND ITS IMPLICATIONS FOR ETHNOARCHAEOLOGY AND ARCHAEOLOGY

Presently archaeologists have only a preliminary understanding of the relationship between ceramics and how they reflect the regional, social, and economic contexts in which they are made, used, and discarded. This study of the Gamo importantly illustrates the necessity for examining archaeological ceramics in terms of their life-cycle to reveal past socioeconomic systems. Ceramic ethnoarchaeology provides valuable information from which archaeologists can gain better insights into regional, social, and economic relationships in congruence with the environment, diet, spatial, and demographic contexts. In particular I focused on how the influx of industrial wares, the ceramic life-cycle, ceramic spatial analysis, ceramic use-alteration, ceramic volume and frequency, and vessel use-life reflect differences and similarities between villages, castes groups, and economic wealth groups. It is these contexts and issues that are brought together which form the basis from understanding human behavior from the archaeological record.

Village, Caste, and Economic Wealth Variation

Industrial Wares

Although potters are a despised lower caste in Gamo society, they produce pots that are used by all rural households of every socioeconomic level. One of the most

remarkable aspects of Gamo society is that industrial type vessels have not dramatically replaced the ceramic assemblage. This is especially true in villages (e.g., Guyla) that are located farther away from large towns. However, even in the villages of Zuza and Etello where industrial vessels are used, pottery vessels continue to be purchased, used on a regular basis, and dominate the household assemblage. Although in Gamo the higher caste and wealthiest households have more industrial and ceramic containers than the low castes and poorer households, they still rely on ceramic containers for the majority of their household needs. The Chinese porcelain cup has replaced the traditional coffee cup in all Gamo households. In addition, plastic water containers are found in many of the homes of Zuza and Etello. However, metal vessels are rare in Gamo because they are still too expensive for the average rural household. Industrial wares have not replaced pottery because pottery remains an inexpensive technology and the patron-client system between potters and consumers is still a powerful element of Gamo society. Because pottery in Gamo society remains an integral part of the household technology without being replaced by industrial products, it provides important examples concerning the interaction between people and their pottery that can be tested in the archaeological record.

Ceramic Life-Cycle

Ethnoarchaeologists have found that the socioeconomic position, geological conditions, and proximity to resources affects potters' procurement of clays and tempers (Arnold 1991:23; Aronson et al 1994:88; Davison and Hosford 1978; Haaland 1978:49; Handler 1963:315-316; Lauer 1974:143-144; Rye and Evans 1976:126; Van

de Velde and Van de Velde 1939:22). The low social and economic position of Gamo potters, as well as geological constraints and resource proximity, dramatically influences where they obtain their clays and tempers. Gamo potters have to rely upon farmers for access to clays and tempers, since many potters do not own farmland. For archaeologists, the study of Gamo potters support previous research that clay and temper sources usually are found within a 7-kilometer radius of the potter's village (Arnold 1985:39-52).

Previous researchers reveal that the types of foods and the technology required to process them significantly affects household vessel frequencies and types (D. Arnold 1985:127-144; P. J. Arnold 1991:64-65; Nelson 1985:168-169). The analysis comparing ceramic production and distribution among Gamo villages revealed important evidence that contributes to why potters produce and consumers use different proportions of vessel types. The types of vessels that Gamo potters produce is partly a reflection of their ecological location and the types of crops people grow and harvest. Because Gamo society is virilocal, women must learn the new village's ecology and pottery technology. The ecology and technology dramatically influences the types of pots potters begin to produce in their husband's village. An example of the importance of the ecology and technology is witnessed when a Zuza potter who specialized in making baking plates moved to her husband's village of Guyla. In her new village, she completely stopped producing baking plates because the Guyla people do not use baking plates, nor are Guyla clays suitable for this vessel form. Therefore, the location of pottery manufacturing in relation to vessel form as well as the ecological zone, can aid in a more accurate interpretation of subsistence.

Researchers have discussed the important role household pottery provides in distinguishing social status and economic wealth (Deal 1998:101-107; Longacre 1985:337; Miller 1985:74; Otto 1977, 1984; Smith 1987; Trostel 1994:223; Wilson 1994:55). My study found patterns relating to the household's social status and economic wealth such as vessel quality, frequency, size, type, and function. Lower artisan castes and economic ranks purchase and use less expensive pots than the higher caste and economic ranked households. Lower castes and economic ranks have, on average, fewer vessels, vessel types, and smaller pots and use these vessels less to process high-cost foods than the higher caste and the wealthy households. Because fewer pots are used in the lower socioeconomic households, their use of frequency increases, which reduces the pot's use-life. These findings concerning the relation of pottery and the socioeconomic context can make a significant contribution to how archaeologists interpret the social status and economic wealth of past societies. Hence, archaeologists should examine the quality and frequency of household ceramics to interpret socioeconomic status.

It is important to understand where potters are manufacturing pots and how consumers are obtaining their vessels in order to reconstruct social relations in past societies. Previous ethnoarchaeological research indicates that because of the inadequate distribution of pottery vessels, non-pottery-producing villages stockpile vessels, whereas pottery-producing villages do not (Aronson et al. 1994:101; Nelson 1981:171; Tani 1994:56). The Gamo represent an anomaly in the cross-cultural studies between non-pottery-producing and pottery-producing villages, as Etello has far fewer pots per household than in the pottery-producing villages of Zuza and Guyla. The

household census among the three Gamo villages provided a framework for understanding regional differences, specifically addressing variability between villages, as it is apparent that differences occur between villages that are pottery producing and non-pottery-producing. The regional variability concerning the location of potters influences how producers and consumers interact, which ultimately affects each village's household assemblages. This is demonstrated by the two distinct types of distributions, the patron-client and the market exchanges. Consumers prefer specific pottery-producing regions or villages because of their technological attributes (Tables 4-11, 4-12, and 4-13). For example, Guyla and Etello consumers prefer Birbir pots, however, Guyla consumers are tied to purchasing their pots through the patron-client system because of the presence of potters living within their village (Figure 4-3). Since Etello, a non-pottery-producing village, buys all of their pots from weekly markets, the origins of its village ceramic assemblages are extremely diverse. Zuza consumers also are tied to the patron-client system because they live in a pottery-producing village and region. The patron-client and market systems affect the types of pots found within each village. There is not a strong connection between consumer and potter in Etello, and hence consumers living without potters purchase and use only what is absolutely necessary to meet their household needs. The variability in the clays, tempers, vessel morphology, and stylistic attributes within an archaeological site should suggest whether potters are living within the village or if consumers are forced to obtain their household pots from a range of potters.

Several ethnoarchaeologists have provided evidence that mending and reuse of vessels is an important component in the life-history of pots (Deal 1998:107-111, 169;

Deal and Hagstrum 1995; Stanislawski 1969). However, archaeologists often neglect to discuss mending and reuse in their analyses (although see Sheets 1992:45, 49-50). My findings suggest that once vessels break, people either try to mend them using a combination of materials, reuse the vessel for storage of crops, or for a lid, or they discard the vessel. The reuse of vessels is an important component of the life-cycle as almost one-third of the vessels inventoried were in their reuse stage. As expected, the largest and most expensive vessels are mended because of their economic value. In addition, Etello (a non-pottery producing village) mends more vessels than Zuza or Guyla because it is more difficult in terms of time and energy for Etello consumers to obtain a new vessel. However, Etello households reuse a lower percentage of their assemblage than either Zuza or Guyla, which was not expected. Guyla reuses a higher percentage of their broken vessels than Zuza, predominantly for the storage of surplus grain. In addition, I expected that the lower caste and economically poorer households would mend and reuse more of their vessels. Instead, the higher castes and wealthier households mend and reuse a higher percentage of their vessels. The reason for this is they need their reused pots to store their surplus grain. The only exception is between Zuza's *mala* and *mana* caste households, as the *mana* households reuse more of their vessels for pottery production. Lastly, the form and function of the vessel are important determinants concerning whether the vessel will be reused or discarded. If a vessel has a small orifice (i.e., *jebana* / coffeepot) or a cooking vessel has severe breaks or cracks then it is less likely to be reused and is immediately discarded. Archaeologists have not adequately factored reuse into their use-life estimates,

seriously underestimating how long vessels continue to provide substantial household functions before being discarded.

One of the most important life-cycle stages is discard, as it is assumed that the majority of discarded pots are left after abandonment of living areas. As reported in other ethnographic contexts (Deal 1998:118-122; Lindahl and Matenga 1995:106; Nelson 1991:171), Gamo households keep their broken and discarded pots in their houses and kitchen, but also an increased number of these pots are stored within the compound and adjacent to buildings. This "dead storage" indicates that vessels may eventually be used for some function in the future, even though the owner considers the vessels as providing no use (Nelson 1991:171). I expected that higher caste and wealthier households would discard a higher percentage of their assemblage, which has been reported in the archaeological literature (Garrow 1987; Henry 1987; King and Miller 1987:46-47; McBride and McBride 1987; Moran 1976; Otto 1977; Spencer-Wood 1987). However, higher caste and wealthier households discard a smaller percentage of their household assemblages because of the need to reuse vessels for the storage of excess crops and foods. For archaeologists, interpreting vessel function may lead to a better interpretation of household occupation, as well as a society's social and economic conditions.

Spatial Analysis

Archaeologists often use spatial analysis of material remains to determine storage from disposal units, as well as the social, economic, and political relations of a past society (Arnold 1991; Binford 1978; Deal 1998:86-89, 115-140; Hayden and

Cannon 1984; Kent 1999; Schiffer 1972; Sinopoli 1999). The spatial arrangement of the Gamo village and household are directly associated with how the vessels are stored as they move through each stage of their life-cycle. The most significant finding between the different life-cycle stages and their storage patterns is the difference between primary-use and reuse from the storage of discarded pots. Once pots reach the discarded stage, the people in each of the three villages store these pots informally throughout the household property. Another aspect of the spatial study reflects the location of the village landscape, which affects the number and types of buildings found in each household. Zuza, a hill-top village that has a limited amount of land to build on, stores its vessels within specific localities. This is in contrast to the villages of Etello and Guyla, which have access to large amounts of land. Lower social and economic households store their vessels in restricted areas, because they have smaller household properties, usually containing only one building. However, the higher social and economic ranked households have several buildings and as vessels move through their life-cycle they become more dispersed in the household landscape. For an archaeologist, spatial analysis of sites and their associated material remains are an integral component in the interpretation of site use. Thus, the spatial change from primary-use to discard is significant when trying to interpret activity areas, village organization, and socioeconomic status.

Use-alteration

The use of a pottery vessel leaves markers on the ceramic wall that can inform the archaeologist how the vessel functioned in the past. The most pronounced

contribution concerning the use-alteration analyses of Gamo pots is that 100 percent of the vessels used for processing beer exhibited evidence of heavy pitting and/or erosion on the interior of the vessel wall. This is important since it may lead to a better recognition concerning the interpretation between low and high caste and economic ranks, as lower caste and economic ranks rarely processed beer. Furthermore, the vessels that function for single purposes such as the coffee pots (*jebanas*) and cooking pots (*distes*) indicate distinct patterns related to the specific use. Even the multi-functional vessel demonstrated general patterns based on a wet mode of cooking. Finally, an important find is that use-alteration attributes continue to be seen even after the vessel is broken and reused for a secondary function or is completely discarded.

Vessel Volume and Frequency

Ethnoarchaeologists have demonstrated that pottery analysis has the potential to provide estimates of household population (Nelson 1981; Tani 1994; Turner and Lofgren 1966). My analysis among the Gamo concerning vessel frequency and size with household population found differences related to the life-cycle of pots among village, caste, and economic wealth contexts. As pots move through the life-cycle, the correlations become weaker between village and caste population and the size and frequency of vessels. When considering all the ceramics in a household from all stages in the life-cycle or just primary-use vessels there is a strong correlation between the number of people and their pots. Contrasts occur between Etello and the pottery-producing villages of Zuza and Guyla, with Etello having a higher number of significant correlations than pottery-producing villages. This indicates that the non-

pottery producing villages only purchase and use pots that they actually need, whereas pottery-producing village households have excess pots due to the strong patron-client system. Remarkably, the economic wealth analysis has more significant correlations during the reuse stage than during the entire life-cycle or primary-use analyses. This suggests that reused pots are an important component in the processing of foods for wealthy and poorer households. Communal eating among the Gamo demonstrated that this type of serving has great potential in significantly correlating with household populations. Unfortunately for archaeologists, if we are to expect that a majority of the recovered vessels are in discard context, then the Gamo show that interpreting population from discarded vessels remains tenuous. The relationship among household population with vessel frequency and size demonstrates the importance of deciphering the different life-cycle stages.

Use-life

Pottery use-life estimates for utilitarian vessels remain a central component for determining past population estimates, occupation span, site function, social status, and economic wealth (Foster 1960; Longacre 1985; Rice 1987:300; Shott 1996; Tani 1994). The median and mean use-life of Gamo vessels for the different functional classes fall within the median and mean use-life ranges given by other researchers working among a number of cultures throughout the world. The use-life of Gamo vessels in the village, caste, and economic rank analyses is determined by the function, size, frequency of use, production, and cost. Vessel size only influences use-life when controlling for vessel function, indicating the importance of understanding vessel

function in the archaeological record. Production materials and methods seem to influence vessel longevity, which are in agreement with Gamo consumer opinions concerning which potters make the most durable pots. The vessel use-life influences the cost of pots, except for the villages that are dependent upon weekly markets, which are more severely affected by seasonal fluctuations in market prices. My analysis of vessel use-life specifically found that lower social status and economic wealth households use fewer vessels, causing a higher rate of use and therefore a shorter use-life than high caste and wealthier households. Furthermore, the correlation between cost and socioeconomic levels is manifested in the use-life of vessels, since the longevity of cheaper pots is less than well produced expensive vessels.

The purpose of conducting the use-life analyses among the Gamo was to delineate better the contextual variables that affect vessel longevity. This use-life study indicates that procurement, production, distribution, and use all influence when a vessel either enters the reuse or discard stage. Although mentioned above, future research needs to address how vessel reuse affects use-life estimates and its effect on archaeological interpretations.

Future Research

Future Ethnoarchaeological Research

Ethnoarchaeological research must continue to explore the different aspects of the life-cycle stages. Ethnoarchaeological research provides the most comprehensive models for archaeologists when the research is a long-term project. Examples of longitudinal research such as William Longacre's (Longacre 1974, 1981, 1985, 1991;

Longacre and Skibo 1994) Kalinga project in the Philippines and Dean Arnold's (1971, 1987, 1989, 1999) work in Ticul, Yucatán, demonstrate the importance of cultural changes witnessed through pottery.

Southern Ethiopia offers an excellent opportunity to explore pottery because industrial containers have not replaced the production and use of pottery. However, how long this continues remains uncertain. While in Ethiopia I witnessed large trucks overloaded with plastic jerry cans indicating that the first vessel type to be impacted will be the water transport and storage jars. Therefore, research needs to be conducted to understand how pottery, without the large frequency of metal and plastic containers, is produced, used, and discarded before household assemblages change into a mix of pottery and industrial goods. However, the change from pottery to metals and plastics will provide an interesting example of technological change over time (Sargent and Friedel 1986; Skibo 1994).

The complexities of pottery use throughout the vessel's life-cycle can be better interpreted with more use-alteration studies. Further research is needed in societies that use specific vessel types for processing specific foods, as this research and Skibo (1992) and Kobayashi's (1994) research remain as the only use-alteration research conducted within a living context. Conducting more comparative research will help address questions of deciphering a wet mode from a dry mode of cooking. In addition, comparative research of use-alteration will better document how societies process their foods.

Another type of analysis that provides evidence of actual use of a vessel is the study of organic residues, which are found on or within the pottery matrix. The

primary-use of certain classes of ceramic vessels is to process foods, and these foods leave organic residues either on the surface or within the porous wall of the vessel. Archaeologists can extract the organic residues from the vessel in the form of fatty acids. Fatty acids occur in different combinations and proportions in every plant and animal species: they survive normal cooking temperatures and can survive in archaeological deposits, leaving specific signatures (Condamin et al. 1976; Hill and Evans 1989; Patrick et al. 1985; Skibo 1992; Skibo and Deal 1995). Organic residue research is beginning to make an impact on identifying the actual contents of what was processed or stored within ancient ceramics (Badler et al. 1990; Condamin et al. 1976; Evans and Needham 1987). Skibo and Deal (1995) discuss some of the problems of analyzing organic residues that researchers presently must attempt to solve. The problems include the preservation and contamination of organic residues, and identification of the signatures that can be easily attributed to specific plants or animals. Ethnoarchaeologists need to look at how residues change during the life-cycle of pots, the preservation and location of residues, the contamination of residues, and build a comparative database of world crops. Both use-alteration and organic residue analyses have the potential to address questions concerning the changes and development of foods throughout the world.

Unfortunately, the study of vessel reuse has been left out of previous research concerning the use-life of vessels. Previous research on vessel use-life focused only on the primary-use of vessels, thereby leaving out the reuse stage, which is an extremely important component of the ceramic life-cycle. The incorporation of reuse should be integrated into the use-life studies, providing archaeologists more accurate

interpretations of population, site function, or the occupation span of their archaeological sites. Longacre's (1985, 1994) longitudinal study on vessel use-life has demonstrated how long-term research clarifies the accuracy of use-life information (Neupert and Longacre 1994).

Future Archaeological Research

In the future, my research among the Gamo will focus on abandoned households and villages to provide a more contextual history of Gamo society and the cultural changes concerning ceramic production, distribution, use, and discard. Hopefully the Gamo case study has indicated the importance of finding pottery-producing areas as this greatly affects the interpretation of how pots are distributed and used throughout the landscape. The two types of patterns found within pottery-producing and non-pottery-producing villages should be visible in the archaeological record by looking at patterns of paste, temper, morphology, and decorative attributes.

Archaeological research needs to be undertaken in the Gamo region and surrounding hinterlands to address fundamental cultural historical questions. At present we have no culture history of Omotic societies or other linguistic groups in southern Ethiopia. Therefore, before addressing other issues, archaeologist first must address the cultural and chronological questions to build a cultural historical framework of southern Ethiopia. Longitudinal multidisciplinary archaeological research needs to focus on questions of how long specific ethnic groups have occupied the region, as well as how and when they interacted with each other. In addition, Southern Ethiopia has great potential concerning the origins and development of food

production, as it is considered one of the main centers of origin for cultivated plants (Vavilov 1951; Sauer 1952:76-78). Caves, rock shelters, and open air sites need to be located and tested to determine how food production developed and influenced cultural development. Once sites have been located and tested, large scale excavations on sites that reveal great potential need to be conducted.

The social and economic contextual patterns found in the ethnographic present need to be investigated by conducting excavations focusing on a large sample of households. The archaeological excavations of abandoned villages and households should help delineate how castes developed in southern Ethiopia. Spatial analysis of households within the villages, as well as the location and types of material culture should shed light on the interpretation of caste in an Ethiopian context. Locating artisan production sites and their spatial patterns within villages should help address questions related to the emergence of craft specialization.

Closing Thought

This ethnoarchaeological study among the Gamo of southwestern Ethiopia suggests that pottery is a complex technology that significantly contributes to an understanding of regional, political, social, and economic aspects of a society. By controlling for the interaction among procurement, production, distribution, use, reuse, and discard, archaeologists can examine material remains for a better understanding of historic and prehistoric behavior in future archaeological endeavors. I believe that the regional, caste, and wealth analysis in combination with a life-history approach of pots removed some of the interpretive filters that archaeologists must grapple with, and

allowed for a richer, contextualized interpretation concerning the interaction between people and their pots. Thus, it is my optimistic belief that pottery can play a significant role in formulating comprehensive ideas concerning past human behavior.

APPENDIX A
SUMMARY STATISTICS OF VESSELS USED BY GAMO CASTES

Table A1: Summary statistics for the number of vessels concerning castes.

Village, Caste, and # of Houses	n	Mean	Median	s.d	Range
Zuza *mala* (n=17)	308	18.1	14	9.40	9 - 40
Zuza *mana* (n=3)	38	12.7	11	6.65	7 - 20
Etello *mala* (n=17)	202	11.9	11	3.96	6 - 20
Etello *degala* (n=3)	20	6.7	7	2.51	4 - 9
Guyla *mala* (n=14)	366	26.1	25.5	12.85	9 - 57
Guyla *mana* (n=3)	71	23.7	19	13.61	13 - 39
Guyla *degala* (n=3)	53	17.7	17	2.08	16 - 20

Table A2: Summary statistics for the number of vessel types concerning castes.

Village, Caste, and # of Houses	n	Mean	Median	s.d	Range
Zuza *mala* (n=17)	116	6.9	7	2.03	3 - 10
Zuza *mana* (n=3)	18	6.0	6	1.00	5 - 7
Etello *mala* (n=17)	101	5.9	6	1.63	2 - 8
Etello *degala* (n=3)	11	3.7	3	1.15	3 - 5
Guyla *mala* (n=14)	114	8.1	8	1.65	5 - 11
Guyla *mana* (n=3)	24	8.3	8	2.00	6 - 10
Guyla *degala* (n=3)	26	8.7	9	0.57	8 - 9

Table A3: Summary statistics for vessel volume (liters) concerning castes.

Village, Caste, and # of Houses	n	Mean	Median	s.d	Range
Zuza *mala* (n=17)	308	15.2	7.2	21.16	0.06 - 124.72
Zuza *mana* (n=3)	38	8.7	4.5	10.17	0.27 - 50.94
Etello *mala* (n=17)	202	11.5	7.0	15.14	0.38 - 124.72
Etello *degala* (n=3)	20	6.5	6.6	3.40	1.44 - 14.13
Guyla *mala* (n=14)	366	15.2	7.8	23.17	0.06 - 195.33
Guyla *mana* (n=3)	71	12.4	5.7	18.96	0.06 - 104.77
Guyla *degala* (n=3)	53	8.9	5.6	10.44	0.90 - 50.94

APPENDIX B
SUMMARY STATISTICS OF VESSELS USED BY GAMO ECONOMIC RANKS

Table B1: Summary statistics for the number of vessels concerning economic ranks.

Village, Economic Rank, and # of Houses	n	Mean	Median	s.d	Range
Zuza Economic Rank 1 (n=5)	117	23.4	21	14.13	10 - 40
Zuza Economic Rank 2 (n=7)	110	15.7	14	4.92	12 - 25
Zuza Economic Rank 3 (n=8)	119	14.9	13.5	7.41	7 - 31
Etello Economic Rank 1 (n=5)	64	12.8	11	3.96	9 - 18
Etello Economic Rank 2 (n=11)	129	11.7	12	4.19	6 - 20
Etello Economic Rank 3 (n=4)	29	7.2	8	2.36	4 - 9
Guyla Economic Rank 1 (n=7)	212	30.3	29	13.62	17 - 57
Guyla Economic Rank 2 (n=13)	278	21.4	16	10.13	9 - 39

Table B2: Summary statistics for the number of vessel types concerning economic ranks.

Village, Economic Rank, and # of Houses	n	Mean	Median	s.d	Range
Zuza Economic Rank 1 (n=5)	37	7.4	8	2.07	4 - 9
Zuza Economic Rank 2 (n=7)	45	6.4	6	2.07	3 - 10
Zuza Economic Rank 3 (n=8)	52	6.5	7	1.85	3 - 8
Etello Economic Rank 1 (n=5)	36	7.2	8	1.09	6 - 8
Etello Economic Rank 2 (n=11)	59	5.4	6	1.62	2 - 7
Etello Economic Rank 3 (n=4)	17	4.2	4	1.50	3 - 6
Guyla Economic Rank 1 (n=7)	62	8.9	9	1.34	7 - 11
Guyla Economic Rank 2 (n=13)	102	7.9	8	1.57	5 - 10

Table B3: Summary statistics for vessel volume (liters) concerning economic ranks.

Village, Economic Rank, and # of Houses	n	Mean	Median	s.d	Range
Zuza Economic Rank 1 (n=5)	117	17.9	7.9	24.48	0.27 - 124.72
Zuza Economic Rank 2 (n=7)	110	13.9	7.2	18.9	0.06 - 113.04
Zuza Economic Rank 3 (n=8)	119	11.7	5.2	16.41	0.52 - 102.11
Etello Economic Rank 1 (n=5)	64	11.5	5.8	14.14	0.90 - 65.42
Etello Economic Rank 2 (n=11)	129	11.8	7.2	16.07	0.38 - 124.72
Etello Economic Rank 3 (n=4)	29	6.6	6.4	4.06	0.70 - 17.15
Guyla Economic Rank 1 (n=7)	212	14.6	7.7	22.01	0.06 - 150.46
Guyla Economic Rank 2 (n=13)	278	13.8	6.8	21.38	0.06 - 195.33

APPENDIX C
VESSEL TYPE DATA

Table C1: Frequency and percentage of vessel types in the villages of Zuza, Etello, and Guyla.

	Zuza (n=346) n	Percentage	Etello (n=222) n	Percentage	Guyla (n=490) n	Percentage
Jebana	30	8.7	8	3.6	22	4.5
Diste	39	11.3	12	5.4	10	2.0
Otto	112	32.4	62	27.9	135	27.6
Tsaro	47	13.6	33	14.9	79	16.1
Shele	29	8.4	57	25.7	96	19.6
Bache	31	8.9	5	2.3	11	2.2
Tsua	16	4.6	17	7.6	44	9.0
Batsa	30	8.7	16	7.2	44	9.0
Guya	3	0.8	9	4.0	16	3.3
Peele	6	1.7	3	1.4	24	4.9
Gumgay	0	0.0	0	0.0	6	1.2
Kolay	2	0.6	0	0.0	0	0.0
Sene	1	0.3	0	0.0	0	0.0
Tayche	0	0.0	0	0.0	3	0.6

Table C2: Frequency and percentage of vessel types in the village of Zuza according to caste.

Vessel Type	Zuza *mala* (n=308) n	Percentage	Zuza *mana* (n=38) n	Percentage
Jebana	26	8.4	4	10.5
Diste	34	11.0	5	13.2
Otto	102	33.2	10	26.3
Tsaro	42	13.6	5	13.2
Shele	23	7.5	6	15.8
Bache	26	8.4	4	10.5
Tsua	13	4.2	3	7.9
Batsa	31	10.0	0	0.0
Guya	2	0.6	1	2.6
Peele	6	1.9	0	0.0
Gumgay	0	0.0	0	0.0
Kolay	2	0.6	0	0.0
Sene	1	0.3	0	0.0
Tayche	0	0.0	0	0.0

Table C3: Frequency and percentage of vessel types in the village of Etello according to caste.

Vessel Type	Etello *mala* (n=202) n	Percentage	Etello *degala* (n=20) n	Percentage
Jebana	8	3.9	0	0.0
Diste	10	4.9	2	10.0
Otto	54	26.7	9	45.0
Tsaro	27	13.3	6	30.0
Shele	56	27.7	1	5.0
Bache	5	2.4	0	0.0
Tsua	17	8.4	0	0.0
Batsa	15	7.4	0	0.0
Guya	7	3.4	2	10.0
Peele	3	1.4	0	0.0
Gumgay	0	0.0	0	0.0
Kolay	0	0.0	0	0.0
Sene	0	0.0	0	0.0
Tayche	0	0.0	0	0.0

Table C4: Frequency and percentage of vessel types in the village of Guyla according to caste.

Vessel Type	Guyla *mala* (n=366) n	Percentage	Guyla *mana* (n=71) n	Percentage	Guyla *degala* (n=53) n	Percentage
Jebana	13	3.5	5	7.0	4	7.5
Diste	5	1.4	4	5.6	1	1.9
Otto	114	31.1	15	21.1	6	1.3
Tsaro	56	15.3	9	12.7	14	26.4
Shele	67	18.3	16	22.5	13	24.5
Bache	8	2.2	3	4.2	0	0.0
Tsua	36	9.8	6	8.4	2	3.8
Batsa	34	9.3	6	8.4	4	7.5
Guya	10	2.7	3	4.2	3	5.7
Peele	18	4.9	3	4.2	3	5.7
Gumgay	3	0.8	1	1.4	2	3.8
Kolay	0	0.0	0	0.0	0	0.0
Sene	0	0.0	0	0.0	0	0.0
Tayche	2	0.5	0	0.0	1	1.9

Table C5: Frequency and percentage of vessel types in the village of Zuza according to economic rank.

Zuza	Rank 1 (n=118) n	Percentage	Rank 2 (n=110) n	Percentage	Rank 3 (n=118) n	Percentage
Jebana	10	8.5	9	8.2	11	9.3
Diste	13	11.0	11	10.0	15	12.7
Otto	40	33.9	39	35.4	33	27.9
Tsaro	10	8.5	14	12.7	23	19.5
Shele	6	5.1	11	10.0	12	10.2
Bache	14	11.9	8	7.3	9	7.6
Tsua	2	1.7	6	5.4	8	6.8
Batsa	15	12.7	8	7.3	7	5.9
Guya	1	0.8	2	1.8	0	0.0
Peele	6	0.0	0	0.0	0	0.0
Gumgay	0	5.1	0	0.0	0	0.0
Kolay	1	0.8	1	0.9	0	0.0
Sene	0	0.0	1	0.9	0	0.0
Tayche	0	0.0	0	0.0	0	0.0

Table C6: Frequency and percentage of vessel types in the village of Etello according to economic rank.

Etello	Rank 1 (n=64) n	Percentage	Rank 2 (n=129) n	Percentage	Rank 3 (n=29) n	Percentage
Jebana	4	6.2	3	2.3	1	3.4
Diste	3	4.7	7	5.4	2	6.9
Otto	16	25.0	35	27.1	12	41.4
Tsaro	7	10.9	18	13.9	8	27.6
Shele	17	26.6	38	29.4	2	6.9
Bache	1	1.6	3	2.3	1	3.4
Tsua	6	9.4	10	7.7	1	3.4
Batsa	5	7.8	10	7.7	0	0.0
Guya	4	6.2	3	2.3	2	6.9
Peele	1	1.6	2	1.5	0	0.0
Gumgay	0	0.0	0	0.0	0	0.0
Kolay	0	0.0	0	0.0	0	0.0
Sene	0	0.0	0	0.0	0	0.0
Tayche	0	0.0	0	0.0	0	0.0

Table C7: Frequency and percentage of vessel types in the village of Guyla according to economic rank.

Guyla	Rank 1 (n=212) n	Percentage	Rank 2 (n=278) n	Percentage
Jebana	9	4.2	13	4.7
Diste	2	0.9	8	2.9
Otto	61	28.8	73	26.3
Tsaro	34	16.0	45	16.2
Shele	44	20.7	52	18.7
Bache	1	0.5	10	3.6
Tsua	21	9.9	24	8.6
Batsa	15	7.1	29	10.4
Guya	7	3.3	9	3.2
Peele	13	6.1	11	3.9
Gumgay	3	1.4	3	1.1
Kolay	0	0.0	0	0.0
Sene	0	0.0	0	0.0
Tayche	2	0.9	1	0.4

APPENDIX D
CORRELATION (r) TABLES BETWEEN POPULATION AND VESSEL FREQUENCY AND SIZE

Table D1: Entire life-cycle of vessels by village: correlation's between household vessel frequency and volume and population (All bolded cells are significant at the 0.05 confidence level with 18 degrees of freedom).

Entire Life-Cycle - Vessel Frequency and Household Population

Village	Zuza	Guyla	Etello
Function	All Households	All Households	All Households
All Functions	0.23	0.40	**0.67**
Cooking	0.16	0.32	**0.45**
Serving	**0.53**	**0.55**	0.28
Storage	0.17	0.28	**0.45**
Transporting	0.08	0.34	0.02

Entire Life-cycle - Mean Volume (liters) of Pots and Household Population

Village	Zuza	Guyla	Etello
Function	All Households	All Households	All Households
All Functions	0.25	0.28	0.24
Cooking	0.40	0.09	**0.60**
Serving	0.14	-0.13	0.06
Storage	0.23	0.10	0.29
Transporting	-0.11	-0.03	0.11

Entire Life-cycle - Sum Volume (liters) of Pots and Household Population

Village	Zuza	Guyla	Etello
Function	All Households	All Households	All Households
All Functions	0.33	0.39	0.41
Cooking	0.07	0.03	**0.48**
Serving	**0.53**	**0.45**	-0.02
Storage	0.36	0.30	0.35
Transporting	0.01	0.35	0.07

Table D2: Primary-use of vessels by village: correlation's between household vessel frequency and volume and population (All bolded cells are significant at the 0.05 confidence level with 18 degrees of freedom and correlates that fail to coincide to the entire life-cycle analysis are underlined).

Primary-use -Vessel Frequency and Household Population

Village	Zuza	Guyla	Etello
Function	All Households	All Households	All Households
All Functions	0.26	0.35	**0.63**
Cooking	-0.08	0.28	0.36
Serving	**0.62**	**0.49**	0.28
Storage	0.29	0.12	0.29
Transporting	0.08	0.38	-0.24

Primary-use - Mean Volume (liters) of Pots and Household Population

Village	Zuza	Guyla	Etello
Function	All Households	All Households	All Households
All Functions	0.34	0.08	-0.06
Cooking	0.11	0.24	0.08
Serving	**0.46**	0.22	-0.06
Storage	0.2	0.28	-0.03
Transporting	-0.03	-0.05	-0.02

Primary-use - Sum Volume (liters) of Pots and Household Population

Village	Zuza	Guyla	Etello
Function	All Households	All Households	All Households
All Functions	0.30	0.29	0.35
Cooking	-0.03	0.27	0.31
Serving	**0.62**	**0.51**	-0.07
Storage	0.44	0.20	0.12
Transporting	0.07	0.32	-0.06

Table D3: Reuse of vessels by village: correlation's between household vessel frequency and volume and population (All bolded cells are significant at the 0.05 confidence level with 18 degrees of freedom and correlates that fail to coincide to the entire life-cycle analysis are underlined).

Reuse -Vessel Frequency and Household Population

Village	Zuza	Guyla	Etello
Function	All Households	All Households	All Households
All Functions	0.18	0.29	-0.02
Cooking	**0.63**	-0.31	-0.03
Serving	-0.17	0.17	-
Storage	0.01	0.37	-0.08
Transporting	-	-	-

Reuse- Mean Volume (liters) of Pots and Household Population

Village	Zuza	Guyla	Etello
Function	All Households	All Households	All Households
All Functions	0.13	0.34	0.26
Cooking	0.40	-0.33	0.32
Serving	-0.12	0.06	-
Storage	0.11	0.03	**0.50**
Transporting	-	-	-

Reuse - Sum Volume (liters) of Pots and Household Population

Village	Zuza	Guyla	Etello
Function	All Households	All Households	All Households
All Functions	0.21	0.38	0.22
Cooking	**0.69**	**-0.51**	0.08
Serving	-0.12	0.18	-
Storage	0.16	0.34	0.20
Transporting	-	-	-

Table D4: Discard of vessels by village: correlation's between household vessel frequency and volume and population (All bolded cells are significant at the 0.05 confidence level with 18 degrees of freedom and correlates that fail to coincide to the entire life-cycle analysis are underlined).

Discard -Vessel Frequency and Household Population

Village	Zuza	Guyla	Etello
Function	All Households	All Households	All Households
All Functions	-0.03	0.21	0.35
Cooking	-0.04	-	0.20
Serving	-	-	-
Storage	-	-	-
Transporting	-	-	-

Discard- Mean Volume (liters) of Pots and Household Population

Village	Zuza	Guyla	Etello
Function	All Households	All Households	All Households
All Functions	0.03	0.13	0.13
Cooking	0.27	-	0.38
Serving	-	-	-
Storage	-	-	-
Transporting	-	-	-

Discard - Sum Volume (liters) of Pots and Household Population

Village	Zuza	Guyla	Etello
Function	All Households	All Households	All Households
All Functions	0.00	0.07	0.30
Cooking	0.04	-	0.27
Serving	-	-	-
Storage	-	-	-
Transporting	-	-	-

Table D5: Entire life-cycle of vessels by village caste: correlation's between household vessel frequency and volume and population (All bolded cells are significant at the 0.05 confidence level and all cells with an asterisk indicate a strong but not significant result because of the small number of households).

Entire Life-Cycle – Frequency of Pots and Household Population

Village	Zuza	Zuza	Guyla	Guyla	Guyla	Etello	Etello
Function	*Mala* Caste	*Mana* Caste	*Mala* Caste	*Mana* Caste	*Degala* Caste	*Mala* Caste	*Degala* Caste
All Functions	0.20	*0.79	0.44	-0.39	*0.97	**0.65**	*0.92
Cooking	0.13	*0.96	0.36	*-0.70	0.00	0.38	*0.81
Serving	-	*0.72	**0.64**	-0.03	*0.50	0.22	N/A
Storage	0.19	0.24	0.31	*-0.53	*0.86	0.43	0.27
Transporting	0.02	*0.99	0.41	-0.18	*0.86	-0.03	*-0.69

Entire Life-Cycle – Mean Volume (liters) and Household Population

Village	Zuza	Zuza	Guyla	Guyla	Guyla	Etello	Etello
Function	*Mala* Caste	*Mana* Caste	*Mala* Caste	*Mana* Caste	*Degala* Caste	*Mala* Caste	*Degala* Caste
All Functions	0.26	*0.77	0.24	-0.19	0.38	0.21	-0.42
Cooking	0.36	*0.84	0.01	*-0.72	-0.39	**0.68**	-0.45
Serving	-	*0.70	-0.12	*-0.82	-0.26	-0.01	N/A
Storage	0.27	*0.52	0.10	-0.42	-0.19	0.27	*-0.57
Transporting	-0.29	*0.98	-0.10	-0.18	-0.20	0.08	*-0.69

Entire Life-Cycle – Sum Volume (liters) and Household Population

Village	Zuza	Zuza	Guyla	Guyla	Guyla	Etello	Etello
Function	*Mala* Caste	*Mana* Caste	*Mala* Caste	*Mana* Caste	*Degala* Caste	*Mala* Caste	*Degala* Caste
All Functions	0.31	*0.79	0.37	-0.10	*0.87	0.38	*0.56
Cooking	0.05	*0.77	0.37	*-0.95	-0.13	0.44	*0.68
Serving	-	*0.97	**0.59**	-0.27	0.47	-0.13	N/A
Storage	0.41	*0.52	0.30	-0.29	0.40	0.33	*-0.57
Transporting	-0.06	*0.94	0.34	-0.18	0.37	0.02	*-0.69

Table D6: Primary-use of vessels by village caste: correlation's between household vessel frequency and volume and population (All bolded cells are significant at the 0.05 confidence level and all cells with an asterisk indicate a strong but not significant result because of the small number of households. Correlates that fail to coincide to the entire life-cycle caste analysis are underlined).

Primary-use – Frequency of Pots and Household Population

Village	Zuza	Zuza	Guyla	Guyla	Guyla	Etello	Etello
Function	*Mala*	*Mana*	*Mala*	*Mana*	*Degala*	*Mala*	*Degala*
	Caste	Caste	Caste	Caste	Caste	Caste	Caste
All Functions	0.25	0.45	0.40	-0.44	*0.75	**0.64**	*0.57
Cooking	-0.07	-0.27	0.30	*-0.65	0.35	0.29	*0.97
Serving	-	*0.97	**0.59**	-0.18	*0.75	0.21	N/A
Storage	0.30	-	0.09	*-0.98	*0.86	0.26	0.27
Transporting	0.03	*0.96	0.48	-0.18	*0.86	-0.28	*-0.69

Primary-use – Mean Volume (liters) and Household Population

Village	Zuza	Zuza	Guyla	Guyla	Guyla	Etello	Etello
Function	*Mala*	*Mana*	*Mala*	*Mana*	*Degala*	*Mala*	*Degala*
	Caste	Caste	Caste	Caste	Caste	Caste	Caste
All Functions	0.35	*0.68	0.04	*-0.81	*0.91	-0.11	*-0.89
Cooking	0.06	*0.71	0.26	*-0.71	*0.73	0.19	*-0.74
Serving	-	*0.63	0.38	*-0.82	*0.64	-0.17	N/A
Storage	0.22	-	0.30	*-0.82	*0.86	-0.05	*-0.53
Transporting	-0.21	*0.92	-0.07	-0.18	-0.20	-0.06	*-0.69

Primary-use – Sum Volume (liters) and Household Population

Village	Zuza	Zuza	Guyla	Guyla	Guyla	Etello	Etello
Function	*Mala*	*Mana*	*Mala*	*Mana*	*Degala*	*Mala*	*Degala*
	Caste	Caste	Caste	Caste	Caste	Caste	Caste
All Functions	0.29	*0.66	0.30	-0.45	*0.89	0.31	0.14
Cooking	-0.05	*0.59	0.26	*-0.93	*0.62	0.27	0.04
Serving	-	*0.76	**0.67**	*-0.65	*0.75	-0.16	N/A
Storage	0.48	-	0.17	*-0.79	*0.97	0.09	*-0.53
Transporting	-0.02	*0.81	0.34	-0.18	0.37	-0.11	*-0.69

Table D7: Reuse of vessels by village caste: correlation's between household vessel frequency and volume and population (All bolded cells are significant at the 0.05 confidence level and all cells with an asterisk indicate a strong but not significant result because of the small number of households. Correlates that fail to coincide to the entire life-cycle caste analysis are underlined).

Reuse – Frequency of Pots and Household Population

Village Function	Zuza *Mala* Caste	Zuza *Mana* Caste	Guyla *Mala* Caste	Guyla *Mana* Caste	Guyla *Degala* Caste	Etello *Mala* Caste	Etello *Degala* Caste
All Functions	0.11	*0.92	0.26	0.14	*-0.50	-0.02	-0.27
Cooking	**0.61**	*0.88	-0.44	*-0.75	*-0.50	-0.02	-0.27
Serving	-	0.27	0.07	*0.75	*-0.50	0.07	N/A
Storage	0.00	*0.69	0.44	-0.18	N/A	-0.10	-0.10
Transporting	-0.08	*0.97	-0.35	N/A	N/A	0.45	N/A

Reuse– Mean Volume (liters) and Household Population

Village Function	Zuza *Mala* Caste	Zuza *Mana* Caste	Guyla *Mala* Caste	Guyla *Mana* Caste	Guyla *Degala* Caste	Etello *Mala* Caste	Etello *Degala* Caste
All Functions	0.10	*0.98	0.28	*0.95	*0.67	-0.09	0.27
Cooking	0.37	*0.99	-0.48	-0.03	*-0.50	0.36	-0.27
Serving	-	0.27	0.11	*-0.69	*-0.50	0.11	N/A
Storage	0.08	*0.69	0.09	-0.37	-0.41	**0.51**	*-0.69
Transporting	-0.26	*0.78	N/A	N/A	N/A	**0.55**	N/A

Reuse– Sum Volume (liters) and Household Population

Village Function	Zuza *Mala* Caste	Zuza *Mana* Caste	Guyla *Mala* Caste	Guyla *Mana* Caste	Guyla *Degala* Caste	Etello *Mala* Caste	Etello *Degala* Caste
All Functions	0.21	*0.95	0.33	*0.99	-0.19	0.22	-0.42
Cooking	**0.67**	*0.96	*-0.73	*-0.51	*-0.50	0.14	-0.27
Serving	-	0.27	0.17	-0.09	*-0.50	0.11	N/A
Storage	0.18	*0.69	0.36	-0.21	0.00	0.18	*-0.69
Transporting	-0.21	*0.78	-0.41	N/A	N/A	*0.55	N/A

Table D8: Discarded vessels by village caste: correlation's between household vessel frequency and volume and population (All bolded cells are significant at the 0.05 confidence level and all cells with an asterisk indicate a strong but not significant result because of the small number of households. Correlates that fail to coincide to the entire life-cycle caste analysis are underlined).

Discard – Frequency of Pots and Household Population

Village	Zuza	Zuza	Guyla	Guyla	Guyla	Etello	Etello
Function	*Mala* Caste	*Mana* Caste	*Mala* Caste	*Mana* Caste	*Degala* Caste	*Mala* Caste	*Degala* Caste
All Functions	-0.02	-0.27	0.30	-0.45	*-0.50	0.31	*0.96
Cooking	-0.06	-	**0.58**	*0.50	*-0.50	0.17	*0.96
Serving	-	-	-0.33	-0.18	-	-0.07	-
Storage	0.19	*-0.97	-0.30	*-0.65	-	0.48	-
Transporting	0.09	-	0.23	-0.18	-	0.18	-

Discard- Mean Volume (liters) of Pots and Household Population

Village	Zuza	Zuza	Guyla	Guyla	Guyla	Etello	Etello
Function	*Mala* Caste	*Mana* Caste	*Mala* Caste	*Mana* Caste	*Degala* Caste	*Mala* Caste	*Degala* Caste
All Functions	0.08	*-0.74	0.10	-0.36	*-0.50	0.08	*0.75
Cooking	0.27	-	0.37	*-0.97	*-0.50	0.34	*0.75
Serving	-	-	-0.40	-0.18	-	-0.06	-
Storage	0.13	*-0.97	-0.27	-0.06	-	0.10	-
Transporting	0.01	-	0.22	-0.18	-	0.18	-

Discard - Sum Volume (liters) of Pots and Household Population

Village	Zuza	Zuza	Guyla	Guyla	Guyla	Etello	Etello
Function	*Mala* Caste	*Mana* Caste	*Mala* Caste	*Mana* Caste	*Degala* Caste	*Mala* Caste	*Degala* Caste
All Functions	0.02	*-0.74	0.05	-0.24	*-0.50	0.26	*0.97
Cooking	0.04	-	**0.65**	*-0.55	-0.05	0.24	*0.97
Serving	-	-	-0.40	-0.18	-	-0.06	-
Storage	0.13	*-0.97	-0.12	-0.22	-	0.30	-
Transporting	0.08	-	0.23	-0.18	-	0.18	-

Table D9: Entire Life-cycle of Vessels by Village Economic Rank: Correlation's Between Household Frequency and Volume and Population. (All bolded cells are significant at the 0.05 confidence level and all cells with an asterisk indicate a strong but not significant result because of the small number of households.

Entire Life-Cycle – Frequency of Pots and Household Population

Village	Zuza	Zuza	Zuza	Guyla	Guyla	Etello	Etello	Etello
Function	1st Rank	2nd Rank	3rd Rank	1st Rank	2nd Rank	1st Rank	2nd Rank	3rd Rank
All Functions	0.11	0.53*	-0.38	0.28	0.32	0.55*	**0.69**	0.84*
Cooking	0.08	0.26	0.09	0.56*	0.05	0.49	0.38	0.77*
Serving	0.53*	-	-	0.40	0.42	0.10	0.20	0.09
Storage	0.47	0.27	-0.63*	0.21	0.10	0.06	0.68*	0.16
Transporting	-0.34	-0.11	0.02	0.44	0.00	-0.40	0.12	-0.50*

Entire Life-Cycle – Mean Volume (liters) and Household Population

Village	Zuza	Zuza	Zuza	Guyla	Guyla	Etello	Etello	Etello
Function	1st Rank	2nd Rank	3rd Rank	1st Rank	2nd Rank	1st Rank	2nd Rank	3rd Rank
All Functions	0.22	0.33	-0.42	0.70*	0.13	0.27	0.17	-0.24
Cooking	-0.12	0.55*	0.03	0.60*	-0.31	**0.97**	**0.71**	-0.40
Serving	-0.14	-	-	-0.23	-0.26	-0.45	0.18	0.09
Storage	0.16	-0.05	-0.37	0.55*	-0.05	0.02	0.31	-0.54*
Transporting	-0.61*	0.29	0.22	-0.02	-0.17	0.50*	0.18	-0.39

Entire Life-Cycle – Sum Volume (liters) and Household Population

Village	Zuza	Zuza	Zuza	Guyla	Guyla	Etello	Etello	Etello
Function	1st Rank	2nd Rank	3rd Rank	1st Rank	2nd Rank	1st Rank	2nd Rank	3rd Rank
All Functions	0.22	0.58*	-0.48	0.33	0.27	0.34	0.43	0.46
Cooking	-0.29	0.34	-0.01	0.45	-0.14	0.50*	0.35	0.68*
Serving	0.70*	-	-	0.73*	0.09	-0.27	-0.09	0.09
Storage	0.64*	0.33	-0.58	0.29	0.11	-0.09	0.48	-0.54*
Transporting	-0.40	0.24	-0.06	0.23	0.02	0.05	0.14	-0.39

Table D10: Primary-Use Vessels by Village Economic Rank: Correlation's Between Household Frequency and Volume and Population. (All bolded cells are significant at the 0.05 confidence level and all cells with an asterisk indicate a strong but not significant result because of the small number of households. Correlates that fail to coincide to the entire life-cycle caste analysis are underlined).

Primary-use -Vessel Frequency and Household Population

Village	Zuza	Zuza	Zuza	Guyla	Guyla	Etello	Etello	Etello
Function	1st Rank	2nd Rank	3rd Rank	1st Rank	2nd Rank	1st Rank	2nd Rank	3rd Rank
All Functions	0.17	0.20	-0.52*	0.15	0.21	0.55*	**0.69**	0.33
Cooking	-0.10	-0.47	-0.25	0.10	0.15	0.18	0.32	0.33
Serving	0.74*	-	-	0.35	0.27	0.21	0.21	-
Storage	0.64*	0.38	-0.47	0.07	-0.09	0.32	0.10	0.29
Transporting	-0.14	-0.45	-0.28	0.34	-0.05	-0.62*	-0.06	-

Primary-use - Mean Volume (liters) of Pots and Household Population

Village	Zuza	Zuza	Zuza	Guyla	Guyla	Etello	Etello	Etello
Function	1st Rank	2nd Rank	3rd Rank	1st Rank	2nd Rank	1st Rank	2nd Rank	3rd Rank
All Functions	0.05	0.33	-0.41	0.45	-0.23	-0.32	-0.25	-0.65*
Cooking	-0.42	0.39	-0.16	0.30	0.00	0.36	0.07	-0.72*
Serving	0.81*	-	-	0.12	0.08	0.29	-0.18	-
Storage	0.09	-0.25	-0.13	0.80	-0.36	-0.43	0.02	-0.31
Transporting	-0.24	0.10	-0.31	-0.19	-0.25	-0.34	0.12	-

Primary-use - Sum Volume (liters) of Pots and Household Population

Village	Zuza	Zuza	Zuza	Guyla	Guyla	Etello	Etello	Etello
Function	1st Rank	2nd Rank	3rd Rank	1st Rank	2nd Rank	1st Rank	2nd Rank	3rd Rank
All Functions	0.09	0.23	-0.45	0.22	0.09	0.17	0.20	0.12
Cooking	-0.41	-0.17	-0.28	0.13	0.03	0.22	0.18	0.10
Serving	**0.89**	-	-	0.44	0.27	0.19	-0.22	-
Storage	0.68*	0.19	-0.38	0.21	-0.10	-0.25	0.02	-0.31
Transporting	-0.24	-0.03	-0.43	0.12	0.03	-0.49	0.08	-

Table D11: Reused Vessels by Village Economic Rank: Correlation's Between Household Frequency and Volume and Population. (All bolded cells are significant at the 0.05 confidence level and all cells with an asterisk indicate a strong but not significant result because of the small number of households. Correlates that fail to coincide to the entire life-cycle caste analysis are underlined).

Reuse – Frequency of Pots and Household Population

Village	Zuza	Zuza	Zuza	Guyla	Guyla	Etello	Etello	Etello
Function	1st Rank	2nd Rank	3rd Rank	1st Rank	2nd Rank	1st Rank	2nd Rank	3rd Rank
All Functions	0.39	0.45	-0.17	0.16	0.38	-0.14	-0.02	-0.29
Cooking	0.85*	0.48	**0.73**	-	-0.24	-	-0.02	-0.25
Serving	-	-	-	-0.04	0.45	0.11	-	-
Storage	0.28	0.08	**-0.62**	0.35	0.25	-0.30	-0.04	-0.09
Transporting	-0.86*	0.16	0.44	-	-	-	-	-

Reuse– Mean Volume (liters) and Household Population

Village	Zuza	Zuza	Zuza	Guyla	Guyla	Etello	Etello	Etello
Function	1st Rank	2nd Rank	3rd Rank	1st Rank	2nd Rank	1st Rank	2nd Rank	3rd Rank
All Functions	0.55*	0.21	-0.22	0.33	0.13	0.13	0.24	-0.55*
Cooking	**0.94**	0.20	0.32	-	-0.44	-	0.59*	-0.28
Serving	-	-	-	-0.26	0.22	-0.46	-	-
Storage	0.40	0.26	-0.44	0.17	-0.16	0.59*	0.27	-0.40
Transporting	-0.73*	0.16	0.37	-	-	-	-	-

Reuse– Sum Volume (liters) and Household Population

Village	Zuza	Zuza	Zuza	Guyla	Guyla	Etello	Etello	Etello
Function	1st Rank	2nd Rank	3rd Rank	1st Rank	2nd Rank	1st Rank	2nd Rank	3rd Rank
All Functions	0.58*	0.40	-0.36	0.24	0.35	0.16	0.17	-0.41
Cooking	**0.93**	0.49	**0.74**	-	**-0.67**	-	0.28	-0.29
Serving	-	-	-	-0.08	0.36	-0.46	-	-
Storage	0.53*	0.32	-0.52*	0.27	0.18	0.23	0.07	-0.40
Transporting	-0.60*	0.16	0.37	-	-	-	-	-

Table D12: Discarded Vessels by Village Economic Rank: Correlation's Between Household Frequency and Volume and Population. (All bolded cells are significant at the 0.05 confidence level and all cells with an asterisk indicate a strong but not significant result because of the small number of households. Correlates that fail to coincide to the entire life-cycle caste analysis are underlined).

Discard – Frequency of Pots and Household Population

Village	Zuza	Zuza	Zuza	Guyla	Guyla	Etello	Etello	Etello
Function	1st Rank	2nd Rank	3rd Rank	1st Rank	2nd Rank	1st Rank	2nd Rank	3rd Rank
All Functions	-0.55*	0.72*	-0.12	-	0.11	0.07	0.54*	-
Cooking	-0.18	0.70*	-0.09	-	-0.08	0.21	0.24	-
Serving	-	-	-	-	-	-	-	-
Storage	-	-	-	-	-	-	**0.90**	-
Transporting	-	-	-	-	-	-	-	-

Discard- Mean Volume (liters) of Pots and Household Population

Village	Zuza	Zuza	Zuza	Guyla	Guyla	Etello	Etello	Etello
Function	1st Rank	2nd Rank	3rd Rank	1st Rank	2nd Rank	1st Rank	2nd Rank	3rd Rank
All Functions	-0.29	0.24	-0.30	-	0.20	0.43	0.10	-
Cooking	0.17	0.35	-0.19	-	-0.01	0.69*	0.02	-
Serving	-	-	-	-	-	-	-	-
Storage	-	-	-	-	-	-	0.30	-
Transporting	-	-	-	-	-	-	-	-

Discard - Sum Volume (liters) of Pots and Household Population

Village	Zuza	Zuza	Zuza	Guyla	Guyla	Etello	Etello	Etello
Function	1st Rank	2nd Rank	3rd Rank	1st Rank	2nd Rank	1st Rank	2nd Rank	3rd Rank
All Functions	-0.54*	0.45	-0.15	-	0.13	0.18	0.49	-
Cooking	-0.03	0.52*	-0.10	-	-0.14	0.50*	0.15	-
Serving	-	-	-	-	-	-	-	-
Storage	-	-	-	-	-	-	**0.63**	-
Transporting	-	-	-	-	-	-	-	-

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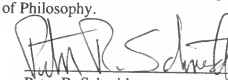

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